GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION
SPONSORED PROJECT INITIATION

OCA

Date: 8/23/78

Project Title: Southeast Regional Appropriate Technology Forum

Project No: B-519

Project Director: J. Tiller

Sponsor: National Science Foundation

Agreement Period: From 7/15/78 Until ~~2/14/79~~ July 31-1979

Type Agreement: CR Contract No. C-ISP78-22994

Amount: $55,866

Reports Required: Semi-Monthly Letter Reports; Recorder's Summaries; Final Report.

Sponsor Contact Person (s):

Technical Matters

Alex Schwarzkopf
Division of Intergovernmental Science
and Public Technology

Contractual Matters
(thru OCA)

Thomas F. Griffin
ASRA/STIA Branch
Division of Grants & Contracts

National Science Foundation
Washington, D.C. 20550

Defense Priority Rating: N/A

Assigned to: Technology & Development Laboratory (School/Laboratory)

COPIES TO:

Project Director
Division Chief (EES)
School/Laboratory Director
Dean/Director–EES
Accounting Office
Procurement Office
Security Coordinator (OCA)
Reports Coordinator (OCA) ✓

Library, Technical Reports Section
EES Information Office
EES Reports & Procedures
Project File (OCA)
Project Code (GTRI)
Other

CA–3 (3/76)

B-519

REGIONAL FORUMS ON APPROPRIATE TECHNOLOGY

FINAL REPORT

by

Jeffrey S. Tiller
Project Director

David S. Clifton, Jr.
Principal Investigator

Robert A. Cassanova, Ph.D.
Principal Investigator

Prepared for

Office of Problem Analysis
Division of Intergovernmental Science
and Public Technology
National Science Foundation

GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station
Technology and Development Laboratory
Economic Development Division
Atlanta, Georgia 30332
February 1979

This report was prepared with the support of the National Science Foundation Applied Science and Research Applications Directorate Award No. C-ISP-78-22994. Any opinions, findings, conclusions or recommendations expressed in this publication are those of the authors and do not necessarily reflect the views of the National Science Foundation.

TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

Acknowledgements

This document represents the combined efforts of many hundreds of people. At least 1,500 folks from around the country participated in the regional forums. We extend our sincere appreciation to them for taking the time to travel to the forums in order to express their views.

We would like to express a special thanks to the many people who helped put together the regional forums -- Andy Freeman, Janet Gillaspie, and Gerry Udell in Eugene; Ken Foster, Roger Caldwell, Terry Triffet, Lina Robinson, and Anna Elias-Cesnik in Tucson; Phil Burgess, Cathy Brotzman, and Bill Henderson in Denver; Tony Furino, Dick Wadsworth, Gene Rodriguez, and Sarah Smith in San Antonio; Evan Rogers and Roberta Ross in Indianapolis; and Tony Krzystofik, Cathy Horvitz, and Bob Kahn in Amherst. Here in Atlanta, we would like to thank Dennis Keener and Lee Burks for their able assistance on the Southeastern Forum. Dennis Creech and Ingrid Kraus deserve special mention for their inputs into the national report and general support of the project activities.

Of course, the NSF sponsors provided the counsel and assistance that made the forums possible. We all have a special appreciation for the work of Alex Schwarzkopf, Lynn Preston, John del Gobbo, John Kaatz, and their very active and able consultant, Ann Becker.

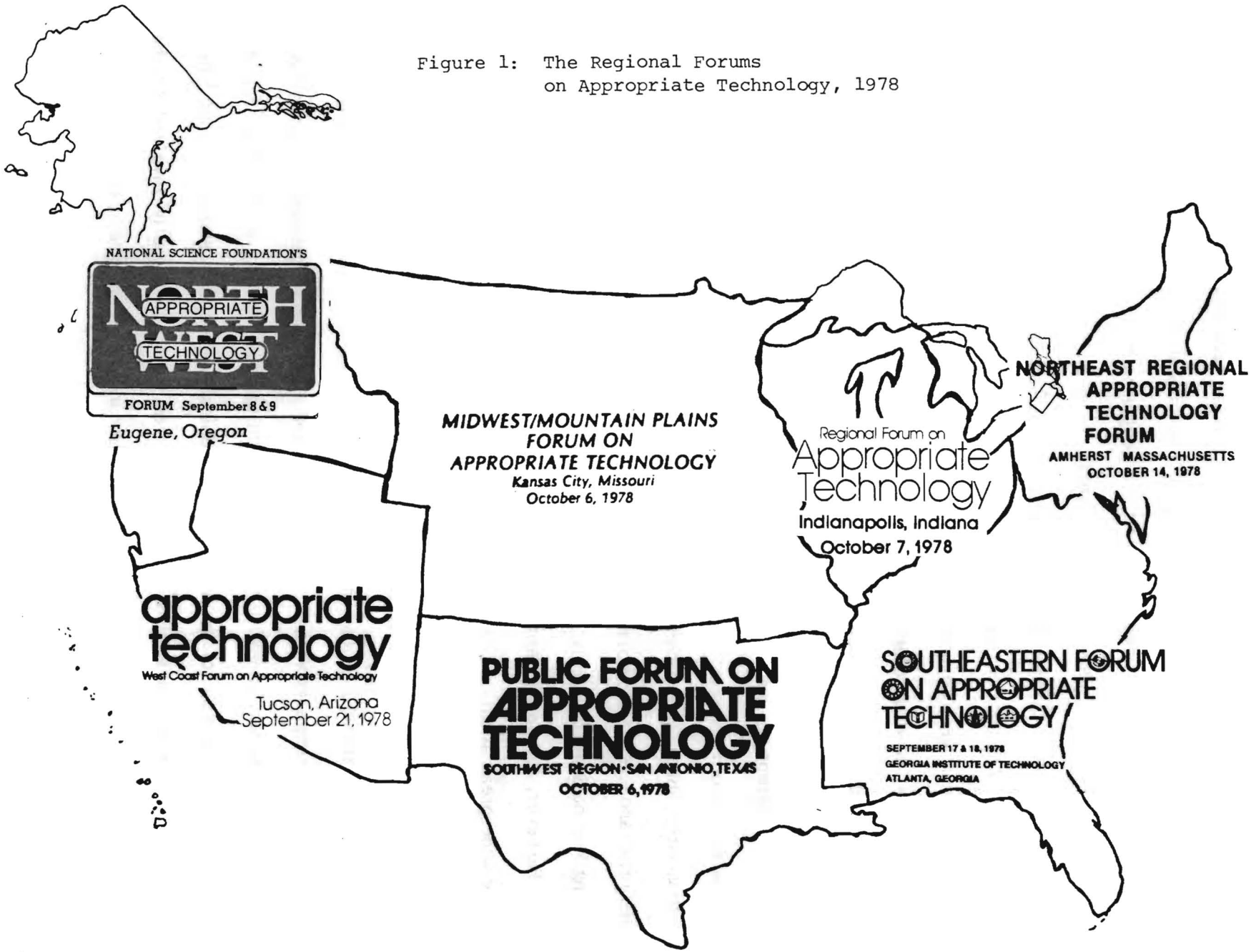
SUMMARY OF THE RECOMMENDATIONS OF THE REGIONAL FORUMS

In the fall of 1978, the National Science Foundation (NSF) sponsored seven regional forums on appropriate technology. Over 1,600 people participated directly in the forums, which were held in Eugene, Oregon; Atlanta, Georgia; Tucson, Arizona; Kansas City, Missouri; San Antonio, Texas; Indianapolis, Indiana; and Amherst, Massachusetts. The locations and dates for the forums are shown in Figure 1.

The forums were designed to investigate the potential for the adoption of appropriate technology, to characterize the needs of appropriate technology practitioners and advocates, and to determine the role of NSF in appropriate technology. Every forum defined appropriate technology differently, but all definitions agreed that technologies that were appropriate were decentralized, conserving, not capital-intensive, democratic, and based on local resources. Almost without exception the attendees were extremely enthusiastic about the potential for appropriate technology. The forums featured energetic and creative discussion about ways in which individuals could contribute to solving our nation's problems and, at the same time, increase their individual quality of life. However, the participants were very concerned about the impediments which exist to the widespread adoption of appropriate technology.

In order for the adoption of appropriate technology to accelerate, many of the barriers need to be removed. Other requirements for adoption include technical research, social science research, education and information dissemination. In perceiving these needs, forum participants voiced strong support for a program of research in appropriate technology. However, many participants had misgivings about the National Science Foundation's sponsorship of such a program unless assurances could be made that appropriate technology practitioners and advocates would be directly involved in the planning and administration. The program structure included in this report, which is based on the inputs received from the forum participants, is organized so as to achieve close

Figure 1: The Regional Forums
on Appropriate Technology, 1978



collaboration between NSF and those interested in appropriate technology. The program activities specifically address the appropriate technology needs identified at the forums.

Figure 2 is a schematic representation of the recommended NSF appropriate technology program. The figure also shows how the program fits the needs identified for the adoption of appropriate technology. The bottom left box depicts the program structure, the large bottom box displays the program activities, and the upper box shows the hierarchy of AT needs.

The program structure is designed for close interaction between the NSF program staff and two advisory committees, one composed of AT practitioners and advocates, and the other having individuals working on AT-related programs in other governmental agencies as members. These three groups would select the specific program activities and determine the more detailed guidelines for the program. The recommended program also uses regional advisory committees, whose members give input in the overall program, help identify peer reviewers in their region, and disseminate information about the program and its activities.

The proposal review process is an important component of the program. Regional forums should include a very active solicitation process. The program should be aimed partly at providing funding to many AT practitioners who are not aware or do not have the skills needed to obtain grants and contracts from government agencies. These practitioners are currently interested in AT research, but are limited in the depth and quality of research they can perform by their own finances. They can effectively use low levels of funding in developing and testing new concepts. Reasons for their effectiveness include their dedication to appropriate technology values, their resourcefulness, and the energy they are willing to devote to expand the field of knowledge of appropriate technology. To meet the needs of AT practitioners, the forum attendees recommended that the program fund many small projects. The Department of Energy's Small Scale Appropriate

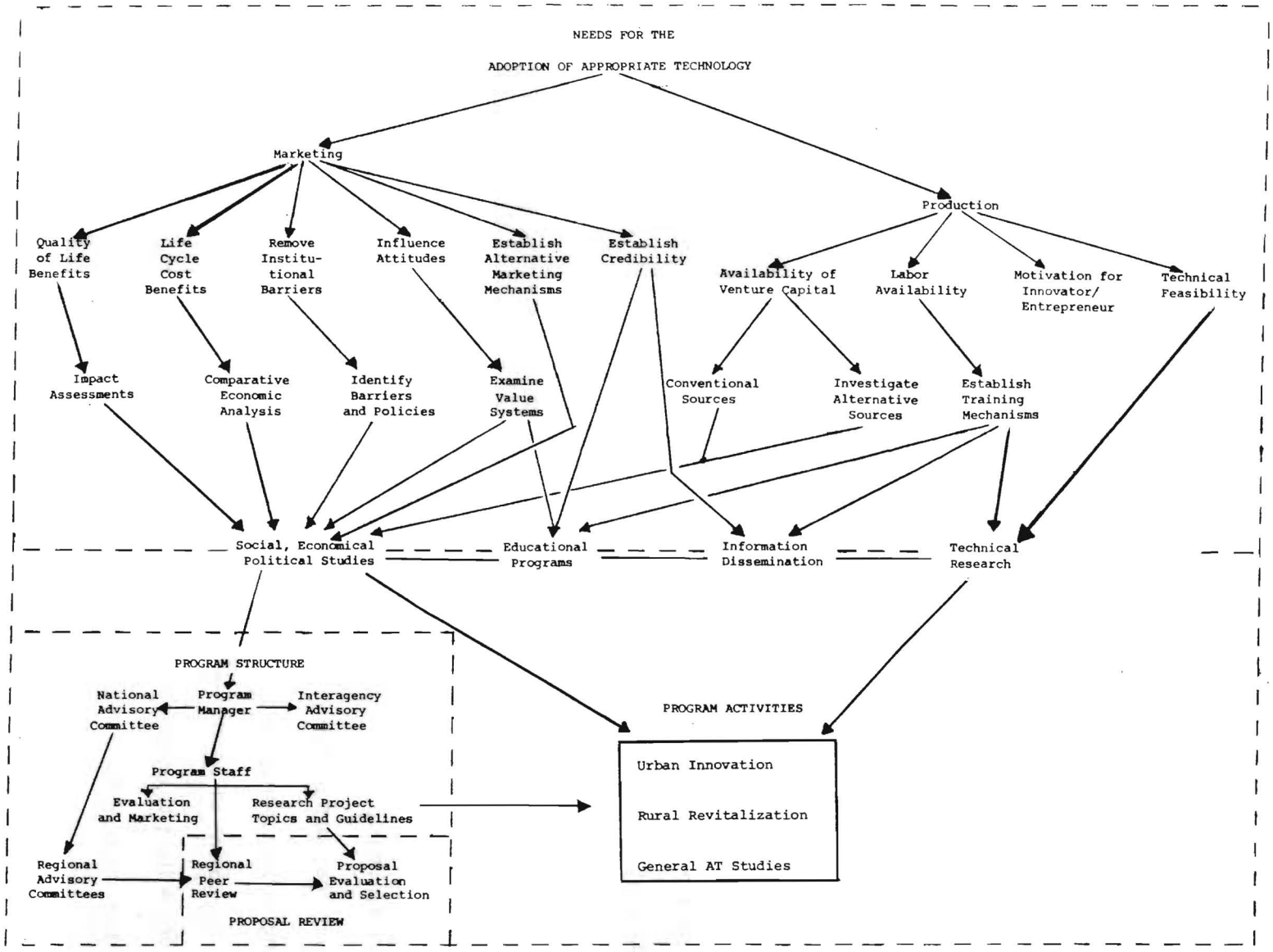


Figure 2: Recommended NSF Appropriate Technology Program Linked to Needs

fund many small projects. The Department of Energy's Small Scale Appropriate Technology Grants Program, which is restricted to energy-related projects, is a model for such a multiple award, small grant process. Research could also be supported by sponsoring design contests in different technologies.

The NSF program should include provisions for funding unsolicited proposals in each of the program areas shown in Figure 2. As emphasized in all of the forums, the proposal submittal and review process should be relatively simple. For example, a standard booklet for unsolicited proposals could be devised. Individuals submitting proposals could simply fill in answers to the questions in the booklet as an initial proposal. Further information required for the evaluation of a proposal could be submitted in letter form.

The forum attendees also perceived a need for social, economic and political research. Projects of this type often involve universities or other research organizations. Participants at the forums were emphatic that these projects, as well as all other program activities, have strong ties to local communities and to appropriate technology advocates and practitioners. A larger scale project, such as an assessment, could be managed by a university, public interest group, research organization or well-qualified individual and involve numerous individuals and groups who are concerned with or who will be impacted by the activity under investigation.

Participants at the forums thought that the criteria by which proposals were judged were a critical consideration. They gave a higher priority to rating the type of project proposed than the quality of the proposal itself. The most important criterion on which to judge a project was its "appropriateness", a descriptor which denotes a project's effect on the environment, contribution to greater self-reliance, promotion of resource conservation, provision for enhanced local employment opportunities, and simplicity and smallness of scale.

NSF's recommended research program in appropriate technology includes social, economic and political studies, technical research, educational activites and information

dissemination. Many of the forum participants believed that education and information dissemination were the most critical needs of AT. The establishment of program areas for both of these activities reflect their importance. Educational activities stress methods of teaching people about AT through existing learning institutions, as well as through innovative learning environments. Technology transfer is also part of the educational program area. The information dissemination program area is designed to provide information and demonstrations of specific technologies and techniques to the general public.

Three major research activities--urban innovation, rural revitalization and general studies--received a great deal of treatment at the forums. Issues addressed through research in the urban innovation activity include the needs of the urban poor, new forms of urban design, technologies to help meet cities' needs, as well as solutions to barriers impeding development of urban appropriate technology. The rural revitalization activity will perform research on needs of small farmers, on environmentally benign and energy conserving agricultural practices, on approaches for meeting technology and service requirements for remote communities, and on employment and business opportunities in rural areas. The general studies activities will perform research into some of the more broad-scoped issues regarding appropriate technology. Examples would include socio-economic studies of alternative development approaches, technological forecasts and assessments, characterization of societal values and their relevance to appropriate technology, and identification of cultural constraints to the adoption of AT. The general studies area will answer some of the basic questions asked by attendees at the regional forums.

Many of the attendees at the regional appropriate technology forums were seeking a reexamination of the science policy of the United States. They believe appropriate technology has a definite role in our nation's future. The National Science Foundation,

which both influences and reflects the science policy of the United States, should aid this reexamination. The program recommended by the forum attendees is objective and comprehensive. The program activities require a commitment on the part of both NSF and those individuals and groups who are practitioners or advocates of appropriate technology. The budget, recommended to be set initially at $10 million, will reflect NSF's commitment. The involvement in the national and regional advisory committees shown by appropriate technology practitioners and advocates will demonstrate their commitment. Throughout the forum process both groups showed a willingness to work together. The recommendations described in this report are for a workable program that both can accept and support.

INTRODUCTION

An increasing number of Americans are recognizing appropriate technology as an alternative approach to conventional technological development. Appropriate technologies are decentralized, require low capital investment, are amenable to management by their users, have insignificant environmental impact, and are conserving in their use of natural resources.

The growing interest in appropriate technology has been spawned by concern for environmental degradation, shortages of key resources, high unemployment, a sense of alienation from institutions, and in general, questions regarding the current quality of life in the United States. The potential role of appropriate technology in solving these problems may be great, but is currently uncertain. Its development will be affected greatly by government policy. In seeking to clarify the position of the federal government in regard to appropriate technology, the U. S. House of Representatives Committee on Science and Technology directed the National Science Foundation to design a program of appropriate technology research.

As part of the planning for the program, the Committee asked the National Science Foundation (NSF) to hold public workshops in different regions of the country. The major objective of the workshops was to broaden public input in a possible NSF program of appropriate technology research. NSF selected seven regions in which to hold the forums. A research organization was chosen to plan, publicize and conduct each of the forums. The locations, dates and organizations chosen for the forums are shown in Figure 1 on page 2. This report reviews and summarizes the results of the seven regional forums. Because each forum was organized by different organizations, no consistent mechanism for recording public sentiment was established. The views and opinions that appear in this document were expressed in a majority of the summary reports of the regional forums. Participants' quotes appear throughout this report to give further clarification and

description of the major recommendations. This document is meant to be an objective summary of the seven forums. Considering the differences in the design of each forum, the nonquantifiability of the opinions given, and the sheer volume of information, summarization is a difficult task. However, the views of the participants have been solicited during the post-forum summarization process through mail-outs of summary reports. We are confident that the recommendations contained herein reflect at least a majority opinion.

DEFINITION AND DESCRIPTION OF APPROPRIATE TECHNOLOGY

Although defining AT was not a major task of any of the forums, most of the forum coordinators provided a definition to the participants. Almost all of the definitions were different. The Southwest Forum Report reviews the sequence of definitions used throughout the planning process for the potential NSF program.

In the fiscal year 1978 House report for authorization, the definition from the fiscal year 1977 authorization bill was quoted:

> Briefly summarized, that description covers those technolgies which are decentralized, which require low-capital investment, which are amenable to management by their users, which are in harmony with the environment and which are conserving in the use of natural resources.

The authorization report further instructs NSF to "... Consider this description or partial definition in its planning for the Program on Appropriate Technology."

In the February 15, 1978, Issue Brief for the sponsored regional forums, the NSF Office of Problems Analysis, Applied Science and Research Applications Division, says:

> For the purposes of this activity, appropriate technology is defined as the application of scientific and technical knowledge on a scale and at a level of sophistication compatible with the resources available, the abilities of the users and the complexities of the situation at the site of application.

Furthermore, the steering committee for the Southwest forum used the following definition in the forum announcement brochure:

> Appropriate technology is that technology which is best suited to the specific cultural, economic, social and political conditions at the site of its application. The design or adaptation of such technology includes an examination of conditions at the site and consideration of several factors normally not identifed. Some of these factors are user preferences for technology which conserves natural resources, which is compatible with local labor skills, and which enhances the social and ecological fabric at the site of its application. The markets for appropriate technology are varied and widely diffused but do include the small-scale farmer, the small-scale businessman and the small-scale manufacturer as well as large-scale activities.

The Southeastern forum report differentiated between AT as a process of social change and AT as a process of inventiveness. The social change-oriented definitions emphasize ideology over technology. As Rainbook says:

> It may seem wrong to categorize dreams and values together with machines and tools as "appropriate technology," but those very different things need desperately to be brought together. Action without vision and vision without action are equally impotent, but together they can perform miracles. And a shift of our concern from quantity to quality, from powerful to skillful tools, and from material and energy resources to human resources implies a shift toward much softer, less visible, and more integral tools.

Inventiveness-oriented definitions identify criteria that qualify a technology as "appropriate." The brochure for the Southeastern Forum defined appropriate technologies as "those technologies and techniques that utilize local resources, both material and human, with the utmost regard for the environment. Development of appropriate technology involves self-reliance on both individual and community scales."

The Southeastern forum report says that many appropriate technology advocates and practitioners actively support the type of social change described in the Rainbook definition. They would also agree with the inventiveness description offered by the Southeastern forum. They may see the social change-oriented definition as an ideal or goal, perhaps even a hidden goal, while implementation of the types of technologies described in the inventiveness-oriented definition is one facet of the path to achieve that goal. Individuals who do not strongly agree, or may even disagree, with the social change-oriented definition may find the inventiveness description very appealing.

In the Northwest forum, David Morris of the Institute for Local Self Reliance defined appropriate technology in terms of "concentric rings of responsibility." The most basic ring is represented by the individual household, the next is the neighborhood, then the community, the state, region, and finally, the country. Appropriate technology attempts to assign appropriate functions and responsibilities to each of the separate circles. For example, sewage is now disposed of through centralized treatment facilities located at the community level. Some studies have shown that individual residential sewage treatment by biological processes is less expensive, has insignificant environmental impact, and conserves water. Therefore, a more appropriate scale of sewage treatment may just be at the individual household level.

THE REGIONAL FORUMS

The seven regional forums were conducted by different organizations working under guidance of the NSF program manager. The planning process for each forum was similar. However, the schedules of activities for the different forums varied markedly to accomodate regional interests. All utilized advisory committees composed of appropriate technology experts and advocates, and other groups within and in some cases, outside of the region. The forum agendas were formed in a series of meetings with members of the project staff, the advisory committee, and others interested in appropriate technology.

The agendas for the different forums contained a variety of activities, including speeches by AT experts, speeches by politicians, small group interactive sessions, testimony given by the general public, audiovisual presentations about on-going AT projects, questionnaires, and actual voting on crucial issues by attendees. Although the formats for the forums differed, they all featured the enthusiastic participation by persons not only interested in AT, but also concerned about our nation's problems.

Northwest Forum on Appropriate Technology

The Northwest Forum on Appropriate Technology was the first of the seven regional appropriate technology forums. The forum was organized by the Innovation Center at the University of Oregon in Eugene, Oregon. The forum was held on Friday and Saturday, September 8 and 9 in Eugene. Appropriate technology was defined in the brochure for the Northwest forum as "a process of technology design, assessment and utilization that emphasizes a reliance on local problem-solving capabilites which are sensitive to environmental, cultural and economic impacts." The specific objectives of the Northwest forum were as follows:

- To provide input to NSF regarding its role in the promotion and applications of AT.
- To give people from the Northwest an opportunity to become informed on the "state of the art" of AT.

- To hold public discussion on the possibilities and problems of AT in the region.
- To allow people time to share their ideas and concerns about AT.

Publicity. Publicity was a major factor contributing to the success of the Northwest forum. The publicity plan sought to encourage participation by individuals with diverse backgrounds. News releases, sent to all major newspapers, radio stations and television stations in the region, were designed to attract the general public. Ads purchased in major newspapers in the region further promoted the forum in the media. The forum planners used mailing lists of organizations oriented to appropriate technology to send word of the forum to 8,500 individuals and groups. Sources for the mailing lists included the Oregon Environmental Council, Western Inventors' Council, Oregon Department of Energy, Cascade Regional Library, and the University of Oregon's Innovation Center and Bureau of External Affairs.

Advisory Committee. The staff for the Northwest forum used a group of consultants to help at the forum itself. People with interests in appropriate technology nominated the twenty-four consultants. In addition, twenty-six other individuals served as facilitators and resource persons. The consultants and resource persons played a critical role in guiding the forum. They served as educators, facilitators and participants. Their presence contributed significantly to the success of the forum.

Forum Agenda. The agenda for the Northwest forum, shown in Table 1, featured a mix of presentations and participant interaction. The first day was confined primarily to speaker-audience interaction. The presentations described an array of AT applications, activities, issues, and organizations. A period for questions and answers was reserved in most cases, although some sessions ran out of time.

The second morning had two sets of concurrent workshops. The forum participants voted to extend the workshop periods to one and three quarter hours in length. The Saturday morning workshops were designed to be the major interactive portion of the

Table 1

NORTHWEST APPROPRIATE TECHNOLOGY FORUM

Friday, September 8, 1978

9:00 - 9:05 **WELCOME, OPENING REMARKS**

Andrew Freeman and Janet Gillaspie, Forum Coordinators.

9:05 - 9:15 *Alex Schwartzkopf, National Science Foundation Representative.*

9:15 - 9:40 **APPROPRIATE TECHNOLOGY: VALUES, ATTITUDES, AND ENVIRONMENTAL CONSIDERATIONS.**

Tom Bender: Staff Rain Magazine, Editor Rainbook, author Environmental Design Primer; Portland, Oregon.

10:00 -11:00
11:15 -12:15 **APPROPRIATE TECHNOLOGY STATE OF THE ART PRESENTATIONS I AND II** (concurrently run; repeated at 11:15).

ENERGY

Lee Johnson: Journalist, Staff Rain Magazine, Steering Committee; Solar '78; Steering Committee, Sun Day; Community Energy and Wind Energy Specialist; Portland, Oregon
Kye Cochran: Director, Alternative Energy Resources Organization; Billings, Montana.
Doug Boleyn: Portland General Electric, Portland, Oregon.

WASTES

Cliff Humphrey: Solid Waste Specialist; Modesto, California.
Mack Walker: California Office of Appropriate Technology; Wastewater Management Specialist; Sacramento, California.
Tom Brandt: Lane County Office of Appropriate Technology, Metals Recovery Specialist; Eugene, Oregon.
Don Williams/Don Coursen: Authors, Lane Economic Development Commission Study--"An Alternative Sewage Plan for Santa Clara, Oregon," Lane County Office of Appropriate Technology, Wastewater Management Specialists; Eugene, Oregon.

LOCAL FOOD PRODUCTION AND MARKETING

Bill Mackie: Former Director, Yamhill County Energy Office, Agricultural Specialist, Oregon Department of Energy, Energy-Land Use Specialist; McMinnville, Oregon.
Mary Louise Flint: California Department of Food and Agriculture; Environmental Assessment Team; Sacramento, California.
Isao Fujimoto: Past Director; National Center for Appropriate Technology; Davis, California.
Linn Miller: Small Scale Farmer, Editor-Publisher, Small Farmers Journal; Junction City, Oregon.
Steve Bossi: Board of Directors, Rural America Inc.: Agricultural Research Consultant, Seattle, Washington.

COMMERCIAL APPLICATIONS

Gerald Udell: Director, Innovation Center, University of Oregon; Eugene, Oregon.
Marcia Grad: Denver Research Institute, National Science Foundation Evaluator; Denver, Colorado

12:15 - 1:15 **LUNCH**

1:15 - 2:30 **APPROPRIATE TECHNOLOGY STATE OF THE ART PRESENTATIONS III AND IV.** (concurrently run; repeated at 2:30).

GROWTH MANAGEMENT

Connie Holvey: Eugene Growth Management Task Force, Eugene, Oregon.
Bill Owen: City Attorney; Davis, California.

COOPERATIVE SKILL DEVELOPMENT

Tom Bender
David Morris: Co-Director, Institute for Local Self-Reliance, co-author (with Karl Hess) Neighborhood Power, Washington, D.C.

TRANSITION THROUGH COMMUNITY EDUCATION

Richard Wenn: Communications Specialist for Santa Clara County, San Jose, California.
Kye Cochran
Brian Livingston: Editor, Cascade Magazine, Staff, Cascadian Regional Library; Eugene, Oregon.

Saturday, September 9, 1978

9:00 - 9:05 **OPENING REMARKS**
Andrew Freeman and Janet Gillaspie, Forum Coordinators.

9:05 - 9:15 *Alex Schwartzkopf, National Science Foundation Representative.*

9:15 - 9:25 **SUMMARY OF FRIDAY'S ACTIVITIES**
Andrew Freeman.

9:30 -10:50 **SMALL GROUP WORKSHOPS I**(concurrently run).

WASTES
Moderator: Mack Walker

ENERGY
Moderator: Lee Johnson

FINANCIAL IMPLICATIONS
Moderator: Frank Manley, Regional Economic Development Specialist, National Center for Appropriate Technology; Butte, Montana.

COMMERCIAL APPLICATIONS
Moderator: Gerald Udell

11:00 -12:30 **SMALL GROUP WORKSHOPS II**

EDUCATION/ORGANIZING
Moderator: Kye Cochran

AGRICULTURE
Moderator: Steve Bossi

GROWTH MANAGEMENT
Moderator: Bill Owen

GOVERNMENT'S ROLE IN APPROPRIATE TECHNOLOGY
Moderator: Sam Sadler, Director Lane County Office of Appropriate Technology; Eugene, Oregon.

12:30 - 1:30 **LUNCH**

2:30 **"TRANSITIONS: WHERE TO NOW?" TECHNOLOGIES, POLICIES, VALUES**
Roger Blobaum: Chairman of the Board, Rural America Inc.; Boardmember, Center for Rural Affairs; Co-director, Small Scale Energy Project, Creston, Iowa.
David Morris, Co-Director, Institute for Local Self-Reliance, Co-author (with Karl Hess) Neighborhood Power, Washington, D.C.
Tom Bender

forum. They were divided into sessions on major technologies and activities of AT. The moderators had critical roles in determining the success of the workshops. A moderator training session, held Friday night, was intended to provide some direction and advice. The final afternoon session was a series of three talks given by Tom Bender of Rain magazine, Roger Blobaum of the Small Farm Energy Project, and David Morris of the Institute for Local Self Reliance.

The workshop process began with an initial presentation by the moderators. Then, the group identified sub-topic areas they would like to break into for discussing specific problems, issues, and questions. The sub-topic discussions lasted twenty minutes. The problems, issues, and questions identified were recorded on tear sheets. The workshop groups reconvened and discussed criteria for evaluating and ranking the problems. The sub-topic groups then attempted to rank what they had identified using the criteria. There was no provision for a summary report of each workshop to the entire session.

Mechanisms for Public Input. The major device for receiving written input was an open-ended questionnaire. The tear sheets and tape recordings of the workshop's major topic sessions were a means of recording the verbal inputs.

Attendees. The attendance at the Northwest forum on Appropriate Technology was fairly large. The total number of participants was in the range of 400 to 500. The forum participants included many farmers, AT-oriented government employees, nonprofit institution representatives, AT practitioners in the private sector, and some private and public sector individuals who came to learn more about AT. The most prevalent attendees from an observer's eye were AT activists, enthusiasts, and practitioners. The activists and practitioners were most vocal. Because the consultants for the Northwest forum were among the preeminent spokesmen for AT in the nation, they tended to dominate the plenary sessions at times. However, in the workshops, widespread participation occurred. Many of those who did not actively verbalize their opinions submitted written comments.

Southeast Forum on Appropriate Technology

The Southeast Forum on Appropriate Technology was organized by the Economic Development Division at Georgia Tech's Engineering Experiment Station. The forum was held in Atlanta on Sunday and Monday, September 17 and 18. The organizers of the Southeast forum emphasized both the social change and inventiveness aspects of appropriate technology. In providing a public forum, they attempted to address these two divergent topics. The specific objectives of the forum were as follows:

- To identify appropriate technology activities in the Southeast.
- To recommend a set of possible government activities to foster and guide implementation of appropriate technology in the region.
- To identify specific needs of appropriate technologists in the Southeast.
- To provide a forum in which people interested in appropriate technology can interact and learn from one another.

The agenda for the Southeast forum was flexible, and yet sufficiently structured to obtain public input. The final agenda represented a compromise reached by the forum planners after meeting with the advisory committee and the sponsors. Several vehicles were developed through which the public could provide their opinions.

The Advisory Committee. A critical component of the planning team was the advisory committee. The advisors were in communication with many appropriate technology advocates and practitioners throughout the region. In addition to reviewing the forum plans and attending the forum, paid consultants provided mailing lists and helped promote the forum within their state or area.

The advisory committee played a key role in the forum planning. The advisors changed the emphasis of the forum from technical aspects alone to both technical and process issues. The increased treatment of the process issues reflected more accurately the concerns of appropriate technology advocates and practitioners in the region.

Publicity. The Southeast forum was publicized using the following outreach mechanisms:

- o Brochure mail-out to 4,500 individuals and organizations
- o Telephone contact to numerous key individuals
- o Public service announcements in media throughout the Southeast

The mailing list was compiled through contacts with many individuals and organizations. Representatives from a broad spectrum of public and private organizations, including business, industry, and economic development groups, appropriate technology-related groups, government agencies, environmental groups, minority groups, and other public interest groups, were invited.

Public service announcements were sent to numerous publications. Publications (e.g., newsletters) that have interests in appropriate technology were contacted specifically. Southeastern Press Newswire was paid to disseminate information about the Southeast forum to 3,700 newspapers and radio stations.

The Forum Agenda. After the initial publicity effort, the forum planners devised ways in which the inputs of forum attendees could best be obtained. The agenda, shown in Table 2, was designed to facilitate and encourage participation by all. The workshops constituted the main sessions for public input. The plenary sessions usually featured talks by resource people, but were open to comments and questions from all attendees.

The Sunday workshop topics were generally recognized as the major fields of appropriate technology. In response to the opinions expressed by the advisory committee the Community and Local Government Role workshop, which dealt specifically with potential projects and strategies to be implemented at local levels, was added. The Monday workshop topics were open so that the responses on Sunday could be used to select the second day topics. The topics selected were as follows:

- o Housing and Community Design
- o NSF's Role in Appropriate Technology
- o Forming Appropriate Technology Organizations, and Establishing Information Dissemination Mechanisms.

Table 2

SOUTHEASTERN FORUM ON APPROPRIATE TECHNOLOGY

AGENDA

Sunday, September 17, 1978

12:00 noon — WELCOME

Don Grace, Director of the Engineering Experiment Station at Georgia Institute of Technology

12:15 pm — CURRENT AND POTENTIAL GOVERNMENT PROGRAMS IN APPROPRIATE TECHNOLOGY

Mary Ann MacKenzie, Community Services Administration, Friends of Appropriate Technology

12:30 pm — PERSPECTIVE ON THE NATIONAL SCIENCE FOUNDATION

Alex Schwarzkopf, National Science Foundation

1:00 pm — INTRODUCTION TO WORKSHOPS - OBJECTIVES AND PROCEDURES

Jeff Tiller, Forum Coordinator

1:15 pm — WORKSHOPS

- Housing and Community Design - Planning, Design, Bikeways, Construction Techniques (Ballroom)

  Moderator - *Paul de Vore, West Virginia University*

- Energy - Solar, Wood, Water, Conservation, Transportation (Room 319)

  Moderator - *Ed Passerini, New College, University of Alabama*

- Waste - Resource Recovery, Alternative Sewage Treatment (Room 332)

  Moderator - *Dennis Creech, Atlanta 2000*

- Agriculture - Production, Processing, Land-Use, Marketing (Room 321)

  Moderator - *Lindsay Jones, Agricultural Marketing Project Nashville, Tennessee*

- Industry - Community Industries, Industrial Applications of Appropriate Technology, Entrepreneurship in Appropriate Technology (Room 332)

  Moderator - *Brian Crutchfield, National Center for Appropriate Technology*

- Education - Media, Community Learning, Institutional Program (Room 322)

  Moderator - *Carolyn Graham, Atlanta 2000*

- Community and Local Government Roles (Room 301)

  Moderator - *Larry Shirley, Center for Renewable Resources, Washington, D.C.*

4:15 pm — BREAK

4:30 pm — SUMMARY OF WORKSHOPS

Workshop Moderators

5:30 pm — STATE MEETING ON APPROPRIATE TECHNOLOGY NETWORKING (optional)

8:00 pm — PRESENTATIONS ON APPROPRIATE TECHNOLOGY APPLICATIONS IN THE SOUTHEAST

See Program for Scheduling

* * * * * * * * * * * *

Monday, September 18, 1978

9:00 am — WELCOME AND ANNOUNCEMENTS

Jeff Tiller, Forum Coordinator

9:15 am — RESULTS FROM DAY 1 WORKSHOPS

Jeff Tiller, Forum Coordinator

9:45 pm — WORKSHOPS

The workshop topics will depend on the responses received Sunday. A workshop agenda will be available Monday.

12:15 noon — LUNCH

1:30 pm — SUMMARY OF WORKSHOPS

Workshop Moderators

2:30 pm — THE FUTURE OF APPROPRIATE TECHNOLOGY IN THE SOUTHEAST

Paul de Vore
Ed Passerini
Harriet Barlow
Brian Crutchfield

3:30 pm — ADJOURNMENT

On Monday afternoon, three active appropriate technologists, Ed Passerini of the University of Alabama and The Environmental Action Clearinghouse (TEACH), Paul de Vore of West Virginia University's Engineering Education Program and Harriett Barlow of the Institute for Local Self Reliance, spoke on the future of appropriate technology.

Mechanisms for Receiving Public Input. During the course of the Southeast forum, the following three mechanisms were available for the attendees to make recommendations to the National Science Foundation:

- o Handwritten notes of verbal comments during all sessions
- o Forum questionnaire
- o Open-ended questionnnaire

The handwritten notes were taken by the forum recorders, who were members of the forum staff. In several workshops, two sets of notes were available -- those recorded by the forum staff and those written on flipcharts by the forum moderator. These notes included the major points and recommendations made in each workshop.

The forum questionnaire was composed of a lengthy set of questions developed specifically for the Southeast forum by the staff. Because the questionnaire required a substantial amount of time to complete, one half hour was set aside in the workshop for the attendees to fill it out. Sixty-eight participants completed the questionnaire.

The open-ended questionnaires simply asked for any recommendations the participants wished to make. As the forum questionnaire may not have been sufficiently flexible, the open-ended form was devised to encourage less formal responses. Unfortunately, only nine open-ended questionnaires were returned.

Attendees. Approximately 150 people participated in the Southeast forum. According to the questionnaire, which was completed by almost 50 percent of the attendees, the average participant was a self-employed, 30 year-old urban male who was an advocate of appropriate technology in Georgia. Persons from every state in the region attended the

forum, although Georgians dominated. Dwellers in or near large cities were most numerous, but many rural residents were also present. Attendees were primarily in the age range 26 to 35; unfortunately, no senior citizens completed the questionnaire although they were in attendance. Males dominated the forum in number. The participants had broad-ranging employment, with self-employment, non-profit institutions, private industry, and colleges or universities, in order, being the primary employers. The attendees also had a wide range of involvement in appropriate technology, as AT practitioners, AT advocates, small businessmen, interested citizens and researchers were all well-represented.

The Southeast Forum on Appropriate Technology featured a variety of means for interaction. The attendance was relatively low, and therefore disappointing. Because more people had been expected, seven workshops were scheduled the first day. Thus, despite the presence of resource people, some workshops were not well attended and suffered accordingly. However, the workshops generally went smoothly, produced knowledgeable, useful discussion, and provided good recommendations. The reports by the facilitators were sometimes biased by their own preconceptions, reflecting the facilitators' thinking rather than recommendations of the workshop as a whole. The recorded notes revealed which points were discussed by the workshop participants and which represented the views of the facilitators themselves.

West Coast Forum on Appropriate Technology

The West Coast Forum on Appropriate Technology, held September 21, 1978, in Tucson, Arizona, was hosted by the University of Arizona Office of Arid Lands Studies (OALS). The purpose of the West Coast forum was to participate in planning the potential National Science Foundation program in appropriate technology by soliciting the views of representatives from diverse interests and backgrounds. The forum focussed on the barriers to the adoption of appropriate technology and what the role of NSF should be.

Regionally, the forum sought to include the specific needs and concerns of the southwestern citizens, who often have different perspectives on appropriate technology concerns such as energy, water, land use, economies of scale, transportation , and ethnic sensitivity.

Advisory Committee. The advisory committee, drawn from all four states, represented small businesses, professional societies, state and local governments, community action agencies, the scientific and nonscientic communities, Indian tribes, women's groups, and individuals, and citizens' groups with expertise in appropriate technology. The advisory committee was invited to an evening dinner session the night of the forum. The purpose was to assist in finalizing the role of NSF and other agencies in working toward these solutions. The dinner meeting was the only involvement of the advisory committee members reported by the forum coordinators.

A project steering committee was comprised of three members of the University of Arizona staff and the statewide energy project coordinator for the Community Services Administration's energy programs. The energy project coordinator also serves as a member of the Board of Directors of the National Center for Appropriate Technology. The steering committee met throughout the planning, hosting, and reporting activities for the forum.

Publicity. The key publicity effort was the mailing of the forum brochure. Anticipating that many persons wishing to have input into the forum topics would be constrained by travel costs, the steering committee designed the forum brochure to solicit public comment as well as to announce and promote the forum. The brochure contained a detachable survey sheet. In order to maximize the response and so as not to intimidate potential respondents who may have shunned a lengthy questionnaire, the survey sheet asked only three questions, which are as follows:

> What two areas most urgently need National Science Foundation appropriate technology study and research?

What are the two most significant barriers to adopting appropriate technology?

What should be the role of the National Science Foundation in appropriate technology?

Of the 10,000 brochures mailed in the four-state region, 142 responses were received.

The Forum Agenda. Maximum solicitation of public comment was the key focus of the entire forum structure. The agenda shown in Table 3 was designed in such a way as to draw attention from the outside national perspective into the more appropriate regional and local view just prior to comments of individuals.

The keynote speaker, Dr. Jerry Plunkett of The Montana Energy Research and Development Institute, was asked to address the history of appropriate technology, provide a definition, and describe current AT programs. Presentations of three case studies followed. The first two, presented by Lee Topash and Lina Robinson, focussed on the National Center for Appropriate Technology. The third, presented by Robert Judd, described the California Office of Appropriate Technology. The case study speakers were asked to remark on both successes and failures. Following the case studies, an NSF speaker, John del Gobbo, reviewed the forum purposes.

In the afternoon session, speakers from the four states discussed more detailed barriers to the adoption of appropriate technology. They were followed by two hours of public comment, limited to five minutes per person. Those who had requested to speak ahead of time were heard first, followed by others present until everyone requesting time had spoken. Only about ten to fifteen individuals spoke during this portion of the forum.

Mechanisms for Public Input. The previously discussed brochure survey sheet was an invaluable survey device for obtaining opinions of those who could not attend the forum. Of the 142 responses received, 29 respondents were from consumer groups, 57 were from universities and colleges, 33 were from private citizens and 23 were from various levels of government.

OALS received all of the questionnaires returned by mail, which were in turn compiled and evaluated. The returned written questionnaires were cross-referenced by

Table 3

WEST COAST FORUM ON APPROPRIATE TECHNOLOGY

FINAL AGENDA

MORNING SESSION
Dr. Terry Triffet, Moderator
Associate Dean
University of Arizona
College of Engineering
Tucson, Arizona

9:00-9:10 A.M. WELCOME
Dr. A. Richard Kassander Jr.
Vice President for Research
University of Arizona
Tucson, Arizona

9:10-10:00 A.M. DEFINITION OF APPROPRIATE TECHNOLOGY, HISTORY AND CURRENT PROGRAMS
Dr. Jerry Plunkett
The Montana Energy Research and Development Institute
Butte, Montana

10:00-11:15 A.M. CASE STUDIES: SUCCESSES AND FAILURES
Mr. Lee Topash
Outreach Worker
National Center for Appropriate Technology
Helena, Montana

Ms. Liná Robinson
Board of Directors
National Center for Appropriate Technology
Phoenix, Arizona

Mr. Robert Judd
Director
California Office of Appropriate Technology
Sacramento, California

11:15-11:30 A.M. DESCRIPTION OF NSF AND INPUT SOUGHT FROM FORUM
Mr. John DelGobbo
Office of Problem Analysis
National Science Foundation
Washington, D.C.

11:30-12:30 P.M. LUNCH

AFTERNOON SESSION
Dr. Roger L. Caldwell, Moderator
Associate Professor, Plant Pathology
University of Arizona
Tucson, Arizona

12:30-1:00 P.M. CASE STUDIES: SUCCESSES AND FAILURES (cont.)
Mr. Anthony J. Maggiore Jr.
Chairman of the Board
National Center of Appropriate Technology
Milwaukee, Wisconsin

1:00-2:30 P.M. BARRIERS TO APPROPRIATE TECHNOLOGY: A PANEL DISCUSSION
Mr. Kerry Faigle
Solar Energy Specialist
Utah Energy Division
Salt Lake City, Utah

Mr. Dan Halacy
President
Arizona Solar Energy Association
Glendale, Arizona

Mr. Robert Loux
Assistant Administrator
Energy Conservation and Planning
Carson City, Nevada

Mr. Clinton Pattea
Executive Secretary
Arizona Commission on Indian Affairs
Phoenix, Arizona

2:30-3:00 P.M. BREAK

3:00-5:00 P.M. PUBLIC COMMENT: ISSUES AND NSF ROLE
The Public Comment Session is designed to determine appropriate technology priorities and barriers, and basic and applied research opportunities for NSF.

6:30-9:30 P.M. ADVISORY COMMITTEE MEETING

the type of respondent and by the three main questions asked. Respondents were segregated into four categories: 1) consumer groups (30), 2) universities and colleges (58), 3) private citizens (39), and 4) government (27). Similar responses were combined into more general categories. The results were tabulated in terms of the frequency each category was mentioned.

Some of the speakers during the public comment session submitted their comments to the steering committee in writing. Extra questionnaires were also available at the registration desk and were used by several attendees. The League of Women Voters received a contract to tape record and take thorough notes of all of the proceedings throughout the forum. The proceedings were to be compiled into a comprehensive synopsis of what occurred. All of the verbal comments were categorized, totaled and added to the written comment totals, which were then tallied into grand totals. The grand totals were then assigned numerical priorities so that the most accurate set of weighted results could be presented to NSF.

Attendees. The typical attendee at the West Coast Forum was a male faculty member of the University System of Arizona. Forty-eight of the one hundred and ten attendees, or 44%, were either students of faculty members at colleges and universities. Most were from the University of Arizona in Tucson. Twenty-eight of the attendees (25%) were from different levels of government; thirteen (12%) were from private businesses; and the remaining twenty-one (19%) were farmers, members of Indian groups, members of labor groups or private citizens. Ninety of the attendees (82%) were men and twenty (18%) were women.

Midwest-Mountain Plains Forum on Appropriate Technology

The Midwest-Mountain Plains forum, held in Kansas City, Missouri on Friday, October 6, was organized by the Western Governors' Policy Office (WESTPO), located in Denver.

The forum was designed to identify ways in which the National Science Foundation could facilitate the development, exploration, and evaluation of appropriate technology through basic and applied research, and through new institutional arrangements. Questions to be discussed included the following:

1) What are the important tasks and issues of concern related to the development of AT?

2) What should the future role of the federal government be regarding AT?

3) What responsibilities should NSF assume in the development of AT?

The forum planners believed that the forum would also result in increased public awareness and consideration of the use and development of AT, a wider sharing of information about success and failures in experiments with AT, and a preliminary assessment of the need for and use of small and intermediate technology within the eight state region.

The Advisory Committee. The Midwest-Mountain Plains forum planners used a large advisory committee composed of a variety of persons interested in AT throughout the region. The advisors included AT practitioners, university professors, members of Indian tribes, city managers, public interest activists, members of financial institutions, and journalists. At least two representatives from each state in the region served on the advisory committee. Members were selected from nominations by the WESTPO staff, NSF project sponsors, and the National Center for Appropriate Technology. With the forum staff they formulated the program agenda.

The NCAT advisors, upon request from WESTPO, prepared a series of position papers concerning different aspects of appropriate technology. These papers served to educate persons unaware of some AT issues and were an initial point of discussion in many of the workshops.

Publicity. The advisory committee was responsible for guiding and assisting the WESTPO publicity efforts for the forum. The publicity effort approved by the advisory

committee included two mailings to groups and individuals, as well as two separate press releases sent to newspapers, radio and television stations throughout the region. Thus, over 5,000 invitations were sent to private citizens, appropriate technologists, colleges and universities, trade and professional groups and chambers of commerce. In addition, over 600 press releases were mailed.

The Forum Agenda. As shown in Table 4, the morning workshops were organized somewhat differently than those in other regions. Instead of defining topic areas by technology, the forum planners used major general issues related to the implementation of AT: social implications, research needs, institutional settings, and education and training. This type of structure encouraged the attendees to discuss specific needs of AT, rather than talk about different technologies. The afternoon session focused on urban and rural applications of AT. Because problems in urban and rural settings are different, appropriate technologies may have differing degrees of attractiveness. The major issues that were addressed in discussing AT urban applications included levels of service delivery, neighborhood energy extension agents, energy cooperatives, neighborhood-based technologies, city-wide conservation planning agencies, and codes, laws and regulations. Issues discussed from a rural perspective included agricultural, energy applications, assistance for small farmers, organic farming, food marketing techniques, wastewater treatment, water supply, and transportation.

Mechanisms for Gathering Public Input. The announcements for the Midwest-Mountain Plains forum asked for both comments and position papers. Attendees at the forum were asked to complete a rather lengthy questionnaire, part of which was based on that used in the Southeast forum. A section entitled "Forum Management and Background Paper Evaluation" was added to provide feedback to the forum staff.

The major points discussed at the workshop sessions were written on flipcharts. The moderators used these and other notes, as well as their own impressions, to write

Table 4

MIDWEST/MOUNTAIN PLAINS FORUM ON APPROPRIATE TECHNOLOGY

AGENDA
Friday, October 6, 1978
Crown Center Hotel
Kansas City, Missouri

8:00-9:00 a.m. REGISTRATION

9:00-10:00 a.m. PLENARY SESSION
1. Welcome by Charles B. Wheeler, M.D., J.D., Mayor, Kansas City, Missouri
2. Opening Remarks by Alex Schwartzkopf, Program Manager, Intergovernmental Science and Public Technology, National Science Foundation
   . Description of NSF and Input Sought from the Forum
3. Defining Appropriate Technology by Anne Kunze, South Dakota Representative for Friends of the Earth
4. Overview of the Agenda by Philip M. Burgess, Executive Director, Western Governors' Policy Office (WESTPO)

10:00-12:00 noon CONCURRENT WORKSHOPS
1. Social Implications of Appropriate Technology:
   a) Impact of the Transition to Appropriate Technology on Society
   b) Decentralization to Maximize Self Sufficiency
2. Focused Research and Appropriate Technology
   c) Materials Research and Net Energy Analysis
   d) Research and Development Cracker Barrel-Open Ended Session for Identifying Promising Projects
   e) Support for Grass Roots Small Scale Projects
3. Institutional Settings
   f) Removing Institutional Barriers to Appropriate Technology-Taxation, Building Permits
   g) Incentives for Public Adoption of Appropriate Technology
   h) Capitalizing Appropriate Technology Development-Investment Incentives
   i) Transferring Appropriate Technology Information-International, National, Regional
4. Education and Training
   j) Education for Understanding, Valuing, Adopting, and Financing Appropriate Technology
   k) Marketing Appropriate Technology

12:00-2:00 p.m. LUNCHEON AND APPROPRIATE TECHNOLOGY ROUNDTABLE
Moderator: Bill Henderson, President, Henderson & Associates Ltd.
Speaker: Maria Valdez, People's Alternative Energy Services
Reaction Panel: Dennis Holloway, Environmental Design College, U.C.
William Griffee, House of Representatives, Iowa
Ray Wells, National Western Capital Co., Colorado
Gary Wright, Board of Directors, National Center for Appropriate Technology
. Appropriate Technology Application in a Rural Setting: A Case Study of the San Luis Valley-Roundtable Discussion

2:00-3:45 p.m. CONSURRENT WORKSHOPS
Urban/Rural Perspectives on Appropriate Technology
. Practical Considerations of Implementing Appropriate Technology in Both Urban and Rural Settings will be Addressed by the Working Groups

3:45-4:00 p.m. BREAK

4:00-5:00 p.m. GENERAL SESSION
. Workshop Reports by Moderators

summaries of each workshop. Thus, the questionnaire results, the workshop notes and the moderators' summaries were all major inputs into the final report on the forum.

Attendees. Approximately 150 persons attended the Midwest-Mountain Plains forum. Of these, thirty-seven individuals completed the questionnaire. Most of the respondents were from the Plains states; thirteen were from Kansas, twelve from Missouri, and four each from Iowa and Nebraska. There were three respondents from the Dakotas and two from both Colorado and Wyoming. Sixty-five percent of the attendees who completed the survey were from urban and suburban areas with a population greater than 100,000. Eighteen percent were from rural areas. Of the major involvement in appropriate technology shown by the respondents, six were practitioners, six were advocates, six were interested citizens, five were researchers and one was a teacher. Eight had multiple responses, four classified their involvement as "other", and one respondent said he had no involvement as yet.

Southwest Forum on Appropriate Technology

The Center for Studies in Business, Economics and Human Resources located at the University of Texas at San Antonio organized and conducted the Southwest AT forum on October 6. Preceding the forum, a series of state AT forums were held in Arkansas (September 12), Louisiana (September 26), New Mexico (September 26), and Texas (September 19). Although a formal forum was not held in Oklahoma, input was solicited through individual interviews with twenty-two representative organizations, such as the Sierra Club and the Indian Councils. The state AT discussions generated comments and recommendations which were used to provide a starting point for the San Antonio regional AT forum.

The Advisory Committee. Members of the advisory committee were chosen on the strength of their previous involvement in regional AT programs and their willingness to

serve. The mailing list of a national survey on appropriate technology conducted by NSF in 1977 served as the point of departure for identifying possible advisory committee members. It was complemented by regional contacts available through the National Center for Appropriate Technology (NCAT), the Community Service Administration (CSA), the members of the Urban Consortium, and other pertinent public and private organizations.

Fifteen persons were asked to serve as advisors; all accepted. Five of them reside in Texas, three in Arkansas, three in New Mexico, two in Louisiana, and two in Oklahoma. They represent community organizations, local governments, universities, the National Center for Appropriate Technology, the business community, rural areas, state agencies and environmental groups. Five of them were charged with the additional responsibility of being state coordinators.

The state coordinators assisted in the dissemination, within each state, of information about the forum, conducted a state pre-forum workshop, and reported on proceedings at the San Antonio public event.

Other resource persons who participated in the project were twelve moderators, experienced in leading small group interaction; seven recorders, chosen from UTSA faculty and assisted by nine graduate students; and three consultants. The Southwest Regional forum was conducted in San Antonio on October 6, 1978, only three months after the NSF contract was awarded to UTSA.

Publicity

Each member of the advisory committee forwarded mailing lists of interested organizations and individuals to UTSA. The mailing lists were expanded to include the media in every state, all chambers of commerce, selected businesses, and most local governments. Periodic press releases were continued during the August-October period. Four thousand additional announcements, with a reply form for comments, were mailed to an initial group of potential participants early in September.

Toward the middle of September, another 5,000 individuals and organizations were contacted in the same manner. During the weeks preceeding the state workshops and the Southwest forum, members of the advisory group and staff did intense telephone solicitation. The result was a total attendance of 167 persons at the state workshops and 122 participants at the regional forum. The numbers are not impressive, but because of the intense communication efforts preceeding the forum, the distribution of attendees was reasonably representative of the groups directly and indirectly involved in AT-related activities within the southwest region.

The Forum Agenda. The agenda for the Southwest forum is shown in Table 5. The morning small group sessions discussed appropriate technology applications and problems. The state forums and advisory members suggested the following workshop topics:

- o housing and community design
- o energy
- o agriculture and food supply
- o health
- o education
- o environment and waste
- o economics
- o social issues
- o business and industry

Each workshop picked one or more topics to discuss; topics were not assigned to specific workshops. The objectives of the morning sessions were as follows:

- o To discuss researchable AT topics which were identified in earlier meetings,
- o To add other researchable AT topics to this list and to discuss these, and
- o To obtain from this discussion a sense of urgency, a sense of usefulness, and a sense of commitment.

The afternoon small group sessions sought to identify processes for conducting appropriate technology research as well as to list barriers inhibiting implementation of

TABLE 5

PROGRAM OF THE PUBLIC FORUM ON APPROPRIATE TECHNOLOGY
FOR THE SOUTHWEST REGION
SAN ANTONIO: OCTOBER 6, 1978

7:30 - 8:30 a.m.	REGISTRATION
8:30 - 8:45 a.m.	WELCOME - Dr. James W. Wagener, President UTSA
8:45 - 9:00 a.m.	THE NATIONAL SCIENCE FOUNDATION AND APPROPRIATE TECHNOLOGY - John Del Gobbo, National Science Foundation
9:00 - 9:30 a.m.	STATE COORDINATORS" REPORTS Arkansas - Edd Jeffords Louisiana - Kenneth J. Lacho New Mexico - William Gross Oklahoma - H. Jack Allison Texas - Charles Simien
9:30 - 10:30 a.m.	SELECTED AREAS OF "AT" APPLICATION Food - Dwight Walker Housing - Lee Gordon Waste - Geoffrey Stanford Energy - William Gross
10:30 - 10:45 a.m.	ORGANIZATION OF SMALL GROUP SESSIONS
10:45 - 12:30 a.m.	MORNING SMALL GROUP SESSIONS: "AT" APPLICATIONS/PROBLEMS
12:30 - 12:45 p.m.	BREAK
12:45 - 2:15 p.m.	INVITED SPEAKERS/PANEL DISCUSSION Edd Jeffords "Soft Technology in a Hard World" Peter van Dresser "Resources Conserving Economic Growth" Daria Fisk "Cultural and Social Dimensions of Appropriate Technology" John Castillo "Cities and Appropriate Technology" William A. Gross "The Role of Colleges of Engineering in Low Cost Appropriate Technology" Richard S. Howe "Texas Energy Extension Service"
2:15 - 4:15 p.m.	AFTERNOON SMALL GROUP SESSIONS: RESEARCH PROCESSES AND BARRIERS TO "AT" APPLICATION
4:15 - 4:30 p.m.	COFFEE BREAK
4:30 - 5:15 p.m.	GENERAL SESSION

AT. The objectives of the afternoon session were as follows:

- To discuss processes for identifying AT research projects, performing the research, funding the research, and dissemination,
- To discuss barriers to AT applications and ways of overcoming these barriers, and
- To obtain from this discussion an indication of the role NSF might play in supporting beneficial applications of appropriate technology.

Subsequent to the afternoon sessions, a plenary meeting convened. The meeting featured a panel discussion presenting and commenting on the results of each individual workshop.

Mechanisms for Public Input. Each attendee at the forum received a workbook describing the purposes and objectives of the forum. The workbook contained a "pull-out" survey page that each participant was to fill in after the morning sessions. Each participant was to list a number of problem areas and the corresponding research that is needed in these areas. The survey served as the written input for each participant to list those particular items which may or may not have been discussed in the workshop. At the end of the workshop the surveys were collected from each person. In addition to this written "vehicle", the workshop was recorded on tape, and a recorder took notes throughout the session. Later, the recorder and the moderator discussed the notes to be assured of their accuracy and completeness.

Two other "pull-out" survey pages were designed for use in the afternoon sessions. One dealt with research processes to assist AT activities, and the second dealt with barriers to AT application and ways to overcome these barriers. Again, these survey pages served as written records by which each participant could have an input into the forum. There was no questionnaire used in the forum; thus, the pull-outs were the major form of individual written input.

Attendees. Approximately 122 registrants participated in the Southwest forum. According to the registration forms, the roles of the participants in AT were as follows (some participants selected multiple responses):

- o Practitioner 31
- o Advocate 36
- o Interested citizen 30
- o Researcher 51
- o No indicated interest 18
- o Other 29

The forum was well organized and the material in the workbook, as well as the idea of a workbook, were effective in bringing the concept and purpose of the forum to the direct attention of the participants, moderators, and recorders. The structure of the forum was not demanding in forcing issues; the workshops were open discussions but were moving toward stated objectives. It may have been more effective to have specific workshops on the various AT subjects rather than allowing each workshop to pick their own topics. Also, participants were "assigned" to workshop rooms by a random process using the last digit of a number in the workbook. This precluded participants who had mutual interests and knowledge from working together in a small group session. In addition, no provision was made for sub-groups within these small group sessions.

On the other hand, this process did involve all of the participants and the more open process allowed people who were not familiar with certain areas to voice their own "fresh" opinions. This could be a positive step because individual session recommendations were not necessarily slanted toward the most vocal member of the session. Instead, a range of ideas was presented. This may have better served the purpose of the forum.

Midwest Forum on Appropriate Technology

The Midwest forum was organized by the Indianapolis Center for Advanced Research. The forum was held in Indianapolis on Saturday, October 7. The basic purpose of the Midwest forum was to solicit from concerned individuals their opinions on three issues:

- Should NSF in particular and the federal government in general become involved in appropriate technology?
- Assuming NSF's involvement in appropriate technology, what areas of basic and applied research should be addressed by a potential program? (In other words, what should the research priorities be?)
- How should a possible NSF program be organized and structured?

Advisory Committee. To help assure the widest possible public participation, the forum was planned with the aid of an advisory committee representing a cross-section of individuals and groups involved in appropriate technology. This committee, complemented by members of the forum staff, met on August 28, 1978, to finalize plans for the forum. Significant revisions of the tentative proposal resulted in the final format. Suggestions for keynote speaker, workshop speakers, and moderators were agreed upon by the committee.

The forum speakers and moderators attended a meeting the Friday evening prior to the forum to become acquainted with each other and to discuss the forum, their roles in it, and possible questions and problems that might arise. Representatives of NSF presented the Foundation's purpose in sponsoring the forums and then answered questions. The meeting also considered the role of workshop personnel in facilitating all members of the public in expressing their concerns.

Publicity. Publicity for the Midwest forum was directed at two overlapping audiences, the general public and the appropriate technology community. The primary means of publicity for both groups was by distribution of a brochure. In addition to giving details about the forum, the brochure included a short definition of appropriate technology and a brief description of NSF's current responsibilities. Of the 12,000 brochures printed, all but about 1,000 were distributed in the six state area by mail and placement.

Brochures were sent to 2,000 subscribers of the Acorn newsletter, 2,000 libraries, 155 Indiana state lawmakers, mayors of 200 Indiana cities, 100 of the more active neighborhood associations in the Indianapolis area, and students of Indiana universities.

Posters designed and printed for the forum were distributed to some of the major libraries and bookstores in the six-state area. Media publicity was secured by means of four different news releases and by public service announcements distributed during the pre-forum period. The local affiliates of the three major television networks and the largest independent Indiana television station all covered the forum on October 7.

The Forum Agenda. The Midwest forum was scheduled on a Saturday because of concern that most of the people interested in appropriate technology would have difficulty taking time off from work. In addition, it was also hoped that a weekend date would help facilitate participation by those having to travel longer distances. Table 6 shows the agenda for the forum, which lasted from 9 A.M. to 4 P.M., with a break for lunch. In the initial session, which lasted from 9-10 A.M., forum participants were welcomed to the city and the forum, and the day's activities were introduced. Following this, an NSF representative briefly explained NSF's mission and responsibilities, and the role it plans to take in the field of appropriate technology. A discussion period followed.

The rest of the day was divided into seven workshop sessions. Those in the morning dealt with specific substantive areas of appropriate technology research, while the afternoon sessions focused on the institutional environment of appropriate technology research.

Immediately after the introductory morning session, the audience broke into five concurrent workshops which ran from 10 A.M. until noon. The topics of these workshops were alternative energy systems; food, nutrition and health; transportation; waste and recycling; and housing and urban environment. It was stressed during the initial introduction to the forum that everyone was free to move between workshops. This was done to enable individuals with interests in more than one substantive area to participate in several sessions rather than being forced to select only one.

An important consideration in utilizing the workshop format was the encouragement of the greatest possible public input. Thus, each of the seven sessions was begun with a

Table 6

Midwest Forum on Appropriate Technology

8:00 - 9:00 Registration

9:00 - 9:45 General Session

Introduction - *Evan Rogers/Bob Henderson*

Role of NSF - *Alex Schwarzkopf*

Information - *Roberta Ross*

9:45 - 12:00 Five Workshops

Energy - *Mary Trigg/Dick Curtis*

Food and Health - *Louise Howard/Bethe Hagens*

Transportation - *Al Sobey/Dick Archer*

Waste and Recycling - *Wayne Cowlishaw/Gene Waltz*

Housing and Urban Development - *Cecil Cook/Bill Caddell*

12:00 - 1:00 LUNCH

1:00 - 2:00 Keynote Address - *Alex Wade*

2:00 - 3:00 Workshop: The R&D Process - *Bethe Hagens*

3:00 - 4:00 Workshop: Resources for Appropriate Technology - *Jim Laukes*

short presentation by a speaker to stimulate questions and discussion leaving the rest of the session for comment and exchange.

Mechanisms for Receiving Public Input. There are several ways in which inputs from the public were solicited and recorded for the Midwest forum. First, and foremost, individuals attending the forum expressed their views at each of the sessions. Recorders took careful notes summarizing all the comments and discussion that occurred at each session.

In order to encourage the widest possible public input, members of the public who could not attend the forum were invited to send in their written comments concerning an NSF program in appropriate technology. The forum brochure included this invitation, and 18 individuals responded with communications ranging from short notes to long, carefully drafted letters. The various points raised in these written communications were incorporated, where relevant, with those suggestions made at the forum itself.

Each person attending the forum received as part of the registration materials a one-page questionnaire requesting written comments concerning some of the important issues involved in an NSF program in appropriate technology. This instrument, developed in consultation with Bob Cassanova of Georgia Tech and John Kaatz of NSF, requested specific answers for some questions and also provided for an open-ended or essay type of response. Fifty-three questionnaires were filled out, a return rate of approximately 20 percent of all those attending the forum.

Attendees. To aid in estimating the number of participants, individuals receiving the brochure were asked to preregister using the registration form provided thereon. Of the 296 who preregistered, approximately one-half actually attended.

A total of 258 individuals attended, registered, and received materials on the day of the Midwest forum. This number includes the 24 persons, such as workshop speakers, moderators, and recorders, who had an official capacity with the forum. About 70

percent of the 234 members of the general public who attended the forum were from Indiana. Only Michigan with 15 and Ohio with 9 participants respectively, had more than token representation.

Northeast Forum on Appropriate Technology

The Northeast Forum on Appropriate Technology, held on Saturday, October 14 in Amherst, was organized by the Center for Business and Economic Research at the University of Massachusetts. The specific objectives of the Northeast forum were as follows:

- To identify specific needs of appropriate technologists in the Northeast,
- To discuss the basic issues and policy options available to federal agencies, and recommend a set of possible government activities to foster and guide implementation of appropriate technology tools and methods in the Northeast,
- To decide on appropriate follow-through action to assure that the resolutions and recommendations are accurately reported and responded to, and
- To provide a forum in which people interested in appropriate technology can interact and learn from one another

To achieve these objectives, the forum planners, working with a sizable advisory committee, organized a tightly structured series of workshops designed to maximize citizen input and participation during the one day forum.

Advisory Board. A critical component of the planning team was the advisory board. The advisors were in communication with many appropriate technology advocates and practitioners around the Northeast. The committee members represented the ten states within the region and were knowledgeable in a variety of technical fields. In addition to reviewing plans and attending the forum, many of the advisory board members provided mailing lists, and all helped to promote the forum within their own state or locale.

The plan for October 14th was the product of numerous revisions and alternatives. The most significant step in the revision process was a one-day meeting of the forum's

entire advisory board on August 28, about one third of the way into the project. Board members gathered at the University of Massachusetts at Amherst. Upon arrival, each advisor received a set of materials which included preliminary copies of the forum brochure and the proposed agenda. Most of the meeting time was spent reviewing the goals and plans for the forum. Caveats of the board members were discussed, and after much debate, a revised agenda was established.

In large measure, the success of the forum depended on the reaction of the advisory board members to this meeting. With the conclusion of the Amherst session, they carried the word back to their respective communities and helped set the tone for the forthcoming public event.

Publicity

The success of the Northeast forum depended to a large extent on the outreach campaign. Several methods were used to notify potentially interested persons. The primary vehicle was a 10,000 piece direct mailing of a brochure which described the events of the forum in some detail. Recipients of the brochure were invited to respond either by saying that they would attend or that they wished to contribute comments by mail and receive a copy of the proceedings upon its completion. In all, some 500 persons responded to the mailing, a 5% rate of return.

Mailing lists were secured from numerous periodicals or organizations. Some, such as "UMass' Toward Tomorrow Fair", "Food Monitor", "Alternative Sources of Energy", "People and Energy", "Self-Reliance" and "Solar Age" had orientations similar to those of the AT community. Others, such as "Technology Review", "Bulletin of Atomic Scientists", and "The Futurist", had a more general scientific audience. Press releases to newspapers and magazines were relied on to reach the general public and other constituencies.

A key ingredient in the public notification effort was an issue of New Roots magazine which contained an in-depth examination of NSF, what it might offer to the AT

community and what was planned for the forum. Complimentary copies were sent to persons interested in AT living throughout the ten state region. Pre-registrants of the forum also received complimentary copies of the magazine.

The more informal avenues of notification -- the AT network, for example --were essential as well. The advisory board in particular was a terrific help in letting people in their communities know about the forum and urging their participation in it.

Regrettably, low-income persons and minorities were under-represented at the forum. Likewise, attendance figures fell off markedly from those states most distant from Amherst. Greater time and effort was necessary to achieve a more representative balance.

The Forum Agenda. The agenda for the Northeast forum is shown in Table 7. After an hour-long introductory session, four hours of topic group interaction in workshops commenced. The topics on which workshops were conducted are as follows:

Agriculture/Land use

Business and economics

Community involvement and social impacts

Education

Energy

Housing

Perspectives on government AT policy

Transportation

Water/Waste utilization

The workshop procedures were scheduled in a very structured manner. The moderator played a key role in leading or guiding the discussion. Each topic area workshop was to devise six major research needs as recommendations to the National Science Foundation.

Table 7

NORTHEAST REGIONAL APPROPRIATE TECHNOLOGY FORUM

AGENDA

Saturday, October 14, 1978

8:15 a.m. REGISTRATION

Select topic group; pick up survey

9:00 WELCOME AND INTROUDCTION

Anthony T. Krzystofik, School of Business Administration, University of Massachusetts, Amherst

Alex Schwartzkopf, National Science Foundation

9:15 GOVERNMENT'S ROLE IN APPROPRIATE TECHNOLOGY

C. Richard D'Amato, Legislative Director, Office of Congressman James Jeffords of Vermont

9:35 APPROPRIATE TECHNOLOGY AND THE STRUCTURE OF ECONOMIC ENTERPRISE

Carter Henderson, Princeton Center for Alternative Futures

9:55 REVIEW OF DAY'S AGENDA

Duane D. Dale, Citizen Involvement Training Project University of Massachusetts, Amherst

10:10 TOPIC GROUP SESSIONS CONVENE

10:25 SUB-GROUPS MEET

Identify problems; discuss differences; draft position statements

11:45 TOPIC GROUPS RECONVENE

Review and discuss issues; consolidate and prioritize group position statements; select spokesperson

LUNCH BREAK - 30 minutes - Time to be announced by group facilitator

2:00 PLENARY SESSION: TOPIC GROUP SPOKESPERSONS PRESENT RECOMMENDATIONS - PLENARY VOTE; "TALKING STATIONS" OPEN

Duane D. Dale, Moderator

3:30 STATE CAUCUSES CONVENE

Discuss follow-through activities; local networking

4:00 SUMMARY ADDRESS

Pat Lewis Sackrey, Center for Rural Communities

4:30 FORUM ADJOURNS

During the workshops, the moderators were asked to follow the outline shown below:

10:10-10:25 AM	Explain process, identify sub-group focus themes
10:25-11:45 AM	Meet in sub-groups and determine the top three research recommendations
11:45-2:00 AM	Let each sub-group report. Combine similar recommendations; vote on the six most important. Select a spokesperson to present the six recommendations to the forum body.

All attendees were urged to submit any research recommendations they had on a specifically designed coding sheet. These sheets were submitted to the topic group reporter, who also wrote notes on the workshop proceedings.

The staff employed the day of the Northeast forum consisted of approximately 40 people: technical staff, group facilitators, group recorders and resource people. Because the success of the forum depended on a minimum of technical kinks, a four-hour training and orientation session for the staff was held on October 13. This was directed by the Citizen Involvement Training Project of Amherst, MA and was a major contribution to the quality of the forum.

At the training session, members of the staff met one another, discussed the goals of the forum with representatives of NSF from Washington, and went through a trial run of the process for the next day. A debriefing session and social hour was held afterward. The trial run of the critical segments of the recommendation-writing and recording process was later praised as an essential aspect of the training. It was led by several effective facilitators, who were to a large degree responsible for its success. The trial run pointed out potential problem areas that caused the forum moderators to prepare carefully for the subsequent day's activities. Their preparation contributed to the paucity of technical hitches during the forum.

Mechanism for Receiving Public Input. The Northeast forum was well attended, as about 275 individuals participated in the day's activities. Several technicians were used to obtain and record inputs from the attendees. As discussed previously, reporters made handwritten notes during the topic group workshops and participants were encouraged to submit their research recommendations on coded idea sheets. The voting on the results of the nine workshops revealed the support of the entire forum. Because the voting process consisted of a blanket endorsement or rejection of all six individual workshop recommendations, many attendees were hesitant to vote "no" even if they believed some of the recommendations were weak or poor. In several cases, a relatively high number of abstentions indicated dissatisfaction with the topic groups' recommendations.

During the voting, "Talking Stations" were operating. These stations had tape recorders set up to accept criticisms, comments and suggestions from attendees at the forum. Over 40 statements were recorded in this effective mode of feedback.

A questionnaire was also used to gauge public opinion. The questionnaire was conducted in three rounds. The first round was given to the board of advisors and other selected appropriate technology experts before the forum. The questionnaire for the second round, designed from the 26 responses to round one, was given out at the forum. One hundred forty-one of the attendees responded. The design of the final questionnaire, which was mailed to the forum participants, incorporated the results of round two. Results have not yet been compiled from round three.

The day after the forum, WFRC, a public radio station in Western Massachusetts and its sister station, WPBH in Connecticut, produced a ninety minute radio program about the forum. A live call-in segment of the program successfully attracted responses from five states. The program was a very useful way of reaching a diverse audience and gathering additional public input into possible NSF research activities in appropriate technology.

Attendees. Individuals from each state in the region attend the forum. The percentage of the total number of attendees who came from each state are as follows:

Massachusetts	59%
New York	10%
Vermont	6%
Connecticut	5%
New Jersey	4%
New Hampshire	4%
Maine	3%
Pennsylvania	3%
Delaware	2%
Rhode Island	1%
Other	4%

Of the 141 attendees who completed the round two questionnaire, 35% were researchers, 23% were advocates, 15% were interested citizens and 28% gave multiple answers. Most of the attendees believed themselves to be either very well informed (28%) or somewhat informed (52%) about appropriate technology.

NEEDS OF APPROPRIATE TECHNOLOGY

All of the regional forums discussed the major needs for more widespread adoption of appropriate technologies. The following categories of need were identified as most critical:

Education and information dissemination

Social science research

Determination of economic feasibility

Removing institutional barriers

Technical research

Marketing and business strategies

Evaluation of holistic technology development

Education and Information Dissemination

The need that was emphasized most strongly was for increased AT educational and information dissemination activities. Participants in all forums pointed to the lack of both educational materials and programs. Most participants at the forums would agree with the Southwest forum report that said, "If the facts about AT and the reasons for its adoption were made known to the public, more change would occur." Attendees cited the need to make appropriate technology credible to the public. Thus, educational and information dissemination activities of high quality are a requisite for implementation.

The attendees stressed that descriptions of appropriate technology be clear to the public. An attendee of the Midwest-Mountain Plains forum said, "Technological literacy may well be regarded as one of the basic components of humankind's future survival kit." He called for a major development of programs in technology education. One Midwest forum workshop supported this statement by concluding, "The group felt that community groups need to employ a translator to talk to NSF."

Appropriate technology curricula were identified as a major need in many of the forums. Participants asked rhetorically, "How many AT courses did you have in

school?" People believed that by educating younger people about appropriate technology, more people would enter AT-related fields after graduation. AT courses would also counteract public sentiment that appropriate technology is inferior, for political radicals, unaesthetic, or expensive.

Social Science Research

Many participants believed that although education and information dissemination are important, certain characteristics of American society constrain more widespread implementation of appropriate technology. They contended that the values of many individuals are oriented toward high-growth, increasingly resource consumptive lifestyles. Our present situation demands a change in these values to conserve resources. Research is needed to evaluate and describe current American values and determine the way in which they will affect our future economic, political and technological development. Identification of mechanisms for influencing this development is also needed.

Another major need for social science research is to assess the societal and political implications of alternate technological development strategies. Appropriate technology is a decentralized approach, while conventional trends are toward more centralization. An examination of the impacts of the different approaches would provide citizens and decision-makers valuable information for planning and policy-formulation.

Determination of Economic Feasibility

The economic basis for many appropriate technologies is uncertain. The costs of appropriate technologies, once implemented on a widespread scale, are difficult to project. The costs for conventional alternatives, particularly fossil fuel costs, are even more difficult to forecast.

Many conventional alternatives receive beneficial tax credits that participants in the forums said was, in effect, subsidization. It is difficult to know on what basis to compare appropriate technologies with their subsidized counterparts. Participants in the

forums also criticized the high level of research and development support that centralized systems obtain from the federal government.

For planning purposes, a standard by which to judge competing approaches which differ in their economic, political and social basis is important. For example, how should subsidized and unsubsidized technologies be compared? How can non-economic variables, such as aesthetics, community cohesion and leisure time, be incorporated into an economic analysis? However, the methodologies should be applied cautiously. As Dr. Waggoner warned in the Southwest region's Louisiana State preforum workshop, "If we can get enough cost benefit analysis there will be full employment for economists".

Techniques for evaluating the contributions of technological development to the economic base are also needed. For example, appropriate technologies may require more labor but less capital than a conventional alternative. The net impact of this disparity on regional and national economic indicators, such as employment and income, are a necessary measure of the relative merits of the alternatives.

Removing Institutional Barriers

Institutional barriers are hinderances to the development of an alternative because of interface problems, opposition by other organizations, existence of constraining regulations, or favoritism by institutions for other alternatives. Participants at the regional forums believed institutional barriers posed a major obstacle to implementation of appropriate technologies. In the West Coast forum, the following institutional barriers were noted as critical factors:

People are unwilling to change.

Appropriate technology is counter to centralized big business.

There is a lack of public understanding and education about AT.

Government restrictions constrain implementation.

A lack of venture capital exists for AT applications.

AT faces an established economic system and a lack of market penetration.

Zoning and building codes hinder installation or construction of appropriate technologies.

High initial costs decrease sales.

A clear definition of appropriate technology is lacking.

Subsidies are given to conventional fuels.

Present (conventional) technology possesses inertia.

Institutional barriers are political, economic, and social in nature. They are difficult to quantify or rank. For example, it is hard to determine the degree to which big business, oil companies, and utilities are constraining the adoption of appropriate technologies. Gauging the rate and direction at which people are willing to change is an even more formidable task. New techniques for evaluating institutional barriers are needed.

Because AT is by nature a decentralized approach and an individual approach, it seems contradictory for AT practitioners and advocates to seek support from the centralized federal government. Yet by not obtaining funding or other means of support, these individuals are penalized in achieving increased implementation of appropriate technology. As David Morris said at the Northwest forum, "...the rules of the game that have been built up for the last hundred years force us toward centralization, force us to capital intensive systems, force us to automate systems, and it's very difficult for us in our individual actions and in our writings and our research to overcome that dynamic and those rules..."

A major need is to ensure that the federal government and the public remain open to the concept of appropriate technology. If AT applications in some situations are not warranted, they should not be encouraged. However, if the adoption of AT in a given setting is feasible and advantageous to the citizenry, it should not be discouraged by public representatives, but instead, promoted.

Participants voiced their opposition to many current regulations, especially zoning and codes, which are major barriers to the adoption of AT. Examples that were cited at the forums included codes restricting implementation of solar energy, disallowing installation of composting toilets, and prohibiting nonconventional, resource conserving building designs. Other regulations, such as freight rates which discriminate against shipping of recycled materials, were also cited.

Participants were also concerned about the lack of venture capital available for financing appropriate technologies. Private financial institutions were found to be hesitant, if not opposed, to providing loans for appropriate technology enterprises, especially for solar energy equipment.

One major reason that traditional sources of capital are less willing to offer financing is that many appropriate technologists shun the profit motive in favor of more ideological goals. As observed in the Northwest forum report at the Commercial Applications workshops, "profit maximization and a growth orientation were not strongly evident as group attitudes." Many attendees believed that AT should function much more within private sector. An attendee at the Northeast forum said, "Appropriate technology is the opposite of another mushrooming self-ingrained, self-protecting bureaucracy... I don't want another bureaucracy. I want the hippies to put up their own money and to start their own business and take the School of Business Administration courses I did and learn how to capitalize."

Marketing and Business Strategies

Although not strongly driven by the profit motive, participants were concerned about effective marketing strategies for appropriate technology. The strongest needs for marketing AT were educational--inform people of the quality of life concept and AT's high regard for it; economic--emphasize the life cycle costing payoffs of AT; and pragmatic marketing—use standard techniques to make a more effective presentation of AT.

Technical Research

Participants believed that a number of appropriate technologies were at the commercialization stage; thus, they did not require in-depth technical research. However, many of these technologies had been designed, built, and operated by individuals working independently. Performance testing and monitoring were therefore cited as major needs in currently operating technologies. Appropriate technologies believed to be in this stage were not specifically identified, but would include active solar collectors, a number of passive solar designs, wind energy systems, waterless toilets, organic farming, production of indigenous fertilizers, greywater filtration, aquaculture applications, and integrated pest management.

A number of other technologies are more in the experimental stage. These appropriate technologies need research specifically oriented for smaller scale, community applications. Examples include gasifiers, electric vehicles, some fertilizer production methods, some integrated pest management techniques, photovoltaics, solar thermal power systems, and utility-community energy system interfacing devices.

Other appropriate technologies are techniques or approaches instead of actual devices; that is, software rather than hardware. Research in these areas is in actuality more in the social science realm than in the technical; however, some systems analysis is needed. Examples include viable designs for small scale, labor intensive rural and urban industrial applications, mechanisms for establishing and operating marketing cooperatives, incentive for obtaining citizen participation in activities such as source separation of solid waste, and ways of fostering public input into community design and public policy.

As a mechanism for funding research, the Northeast forum suggested a "Technology Development Fund." This fund would be a new mechanism for channeling both private and public monies into applied AT research, specifically at the high-risk, low-return early developmental stages. Fund recipients would be obliged to pay back their loans once their businesses achieved profit status; in this way the fund could become self-sustaining.

Evaluation of Holistic Technology Development

Another important need is for holistic or integrated design. Too much emphasis in research is placed on the design and performance of individual components. Research is needed that looks at how components fit together and affect the whole. As Don Moore summarized in his workshop at the Southwest forum, "a holistic, interdisciplinary, system design, process oriented approach is necessary to integrate the piecemeal results of the content of AT research to best address the needs and interests of the people whom such research is designed to serve." Examples of large scale systems that warrant research in holistic designs include communities (integrating work location, housing designs, transportation networks, consumption needs, and locations and provision of services) and manufacturing activities (integrating production, transportation, processing, wholesaling, and retailing). Small scale systems would include houses (integrating design, energy use, food production and preparation, and water and waste utilization) and farms (integrating crop location, fertilization, pest control, harvesting, irrigation, waste utilization, and crop drying).

Summary of Appropriate Technology Needs

The needs discussed above are displayed in a summary format in Figure 3. The figure shows the hierarchy of needs for the adoption of appropriate technology. The two major first-order needs are termed marketing and production. Marketing needs are means of generating demand for appropriate technologies, and production needs are requirements for supplying appropriate technologies. This supply-demand paradigm is simplistic, but is a convenient tool for identifying needs for the adoption of appropriate technologies. Second order needs are activities required to either generate demand or supply. These items are not all required for a demand to exist. In most cases, for example, Quality of Life Benefits and Life Cycle Costing Benefits, the items are alternatives having the same goal--to stimulate either the demand for or supply of appropriate technologies.

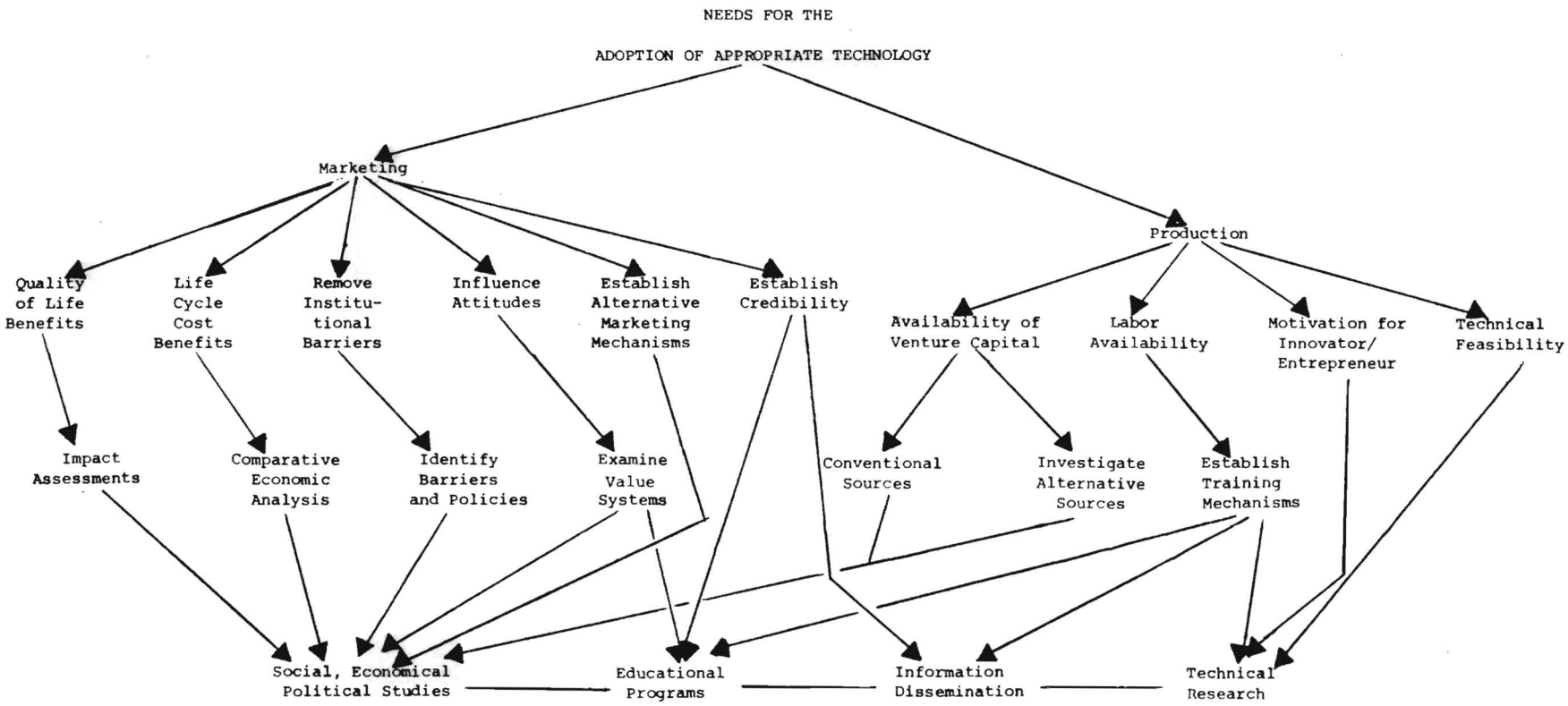


Figure 3: Summary of Appropriate Technology Needs

The third-order needs help solve the second-order needs. For example, Impact Assessments, which might reveal the benefits of adoption of appropriate technologies, would determine the quality of life benefits of AT. Education and information dissemination would help establish the credibility of AT.

The fourth-order needs are, in general, broader categories into which the third order needs fit. The four categories--social, economic, and political studies; technical research; educational programs; and information dissemination--are the major activities that need to be initiated for the adoption of AT to occur.

THE NATIONAL SCIENCE FOUNDATION'S ROLE IN APPROPRIATE TECHNOLOGY

The most vital question to be answered in each of the regional forums was, "Should the National Science Foundation sponsor a program of research in appropriate technology?" The answers in all of the forums were affirmative, with different sets of qualifications. Most participants were willing to let NSF conduct such a program, if it were carried out with the scrutiny and guidance of appropriate technology advocates and practitioners. In the Midwest forum, two-thirds of the 53 respondents to the forum questionnaire answered affirmatively that NSF should develop an AT program. An additional ten percent said NSF should conduct a program if appropriate technologists are involved. Only four individuals said NSF should have no involvement. The Northeast forum report concluded that "...the vast majority (of the AT community in the Northeast) genuinely desires to see participation by NSF in the AT field". At other forums, the interest and success in making constructive suggestions for an appropriate technology program within NSF shows the participants' strong support for the establishment of such a program.

The major qualms about NSF involvement were of two varieties: 1) All of NSF should be oriented toward appropriate technology, not just a small part of it, or 2) Another agency besides NSF should be created to administer the appropriate technology research program. The most vocal forum about NSF policy was the Northwest. Participants there objected that appropriate technology was being cubbyholed into a small program office at a level of about five million dollars, while the remainder of the NSF budget went to "inappropriate" technology. The general air of disgruntlement was so great that the body of the forum unanimously endorsed a resolution that stated: "All NSF funding should be evaluated according to the appropriateness (it provides) to the well being of society." Participants at the Southeast forum echoed this statement. Many attendees at the other regional forums also would probably have agreed. The Northeast

forum supported a resolution seeking a similar type change in NSF policy via another route by saying, "High priority should be given to women, low income people, and minorities, along with AT practitioners, when President Carter appoints new members to the National Science Board."

In the West Coast forum, the advisory committee recommended in a post-forum meeting that, "A new governmental agency paralleling NSF should be created to fund the broad spectrum of applied technology programs. NSF is charged with funding basic research. NSF should not dilute its mission by supporting programs of this type." However, the forum advisors contend that if no such agency can be formed, NSF should be involved under the following guidelines: 1) funding of AT should be integrated within the NSF structure; 2) NSF should fund behavioral and social research projects directed toward effecting attitudinal changes; 3) NSF should reanalyze its role in light of the reality that a basic social need is not being met; and 4) NSF should assume that continuing input into its programs will be received from the AT community.

In many forums, some attendees used the first session to complain about the general lack of support in government for AT. Among the targets was NSF. After venting their frustration, the participants became intrigued by the potential benefits of NSF-sponsored research. The subsequent sessions were quite fruitful.

The inputs received from the regional forums have been combined into a set of final strategies and recommendations. The summary presented here reflects the views of the majority of the participants in the regional forums. Appendix 1 contains a listing of the most important specific recommendations. The set of individual points contained herein have not been officially endorsed by the participants. However, the recommendations recurred with sufficient frequency to be considered favorable by most of the forum attendees. There are two major categories of suggestions for an NSF program in appropriate technology: 1) recommendations for program guidelines, and 2) recommendations for program activities.

Recommendations for Program Guidelines

Most of the participants at the regional forums were cautious of NSF involvement in appropriate technology. They saw NSF as the major research arm for "high" technology and viewed its centralized funding process as counter to the type of process needed by appropriate technologists. Therefore, many of the recommendations of the participants addressed the manner in which NSF should conduct a research program in AT.

This section presents recommendations for the structure of an NSF program in AT. The structure of the program includes the following major components:

- Program planning and administration
- Proposal solicitation
- Proposal review and award
- Criteria for appropriate technology proposal evaluation

Program Planning and Administration. Attendees at the regional forums generally believed that an NSF appropriate technology program should be strongly rooted in existing appropriate technology networks. The following recommendations should increase the ties between NSF and appropriate technologists:

- Establish an appropriate technology committee that has active participation in planning and administering the appropriate technology program. The members of the advisory committee should be balanced both regionally and technically (knowledgeable in diverse appropriate technology fields). Attendees at the regional forums should be considered for the advisory committee.
- Establish a network and mailing list for disseminating information to persons interested in appropriate technology.
- Establish a regional approach for disseminating information and administering grants. Several workshops suggested awards of block grants to be made to state or regional groups qualified to administer an appropriate technology research program.
- Target $10 million/year for the appropriate technology program.
- Hold a public review of the final proposed NSF appropriate technology program.
- Establish mechanisms for and encourage joint ventures with other federal, state and local agencies.

- o Encourage awards with small budgets; perhaps even set a ceiling on the size of awards.

Proposal Solicitation. Participants were emphatic that the AT program be directed to appropriate technology practitioners, many of whom have not had prior experience in obtaining grants. In order to ensure the involvement of AT practitioners in an AT program, the following recommendations were made:

- o NSF should conduct an active outreach and solicitation process for proposals in the appropriate technology program.
- o NSF should offer proposal-writing assistance to those who need it.
- o The appropriate technology grant applications and procurement process should be made simple.
- o Announcement of the appropriate technology program, as well as the awards, should be aimed at groups oriented toward communities or to independent individuals.
- o NSF should encourage "piggy-backing" of appropriate technology proposals with funds from other agencies, with matching funds from the proposer, or with support from other organizations.
- o NSF should solicit for both research-oriented and demonstration-oriented projects.
- o The guidelines for the writing of proposals should encourage, rather than discourage, submission by all sectors.

Proposal Review and Award. The forum participants favored regional peer review because of the differences in appropriate technology needs between regions. They also emphasized that peer reviewers should be individuals concerned with appropriate technology. The peer review should be conducted by individuals with expertise in applying appropriate technology, or by persons with a strong interest in appropriate technology on a community or public interest basis. Academicians, industry personnel and government representatives should not be excluded from peer review if they have appropriate technology expertise.

Criteria For Appropriate Technology Proposal Evaluation. Attendees at the regional forums were very concerned that awards made in an NSF program in AT be "appropriate".

Therefore, criteria felt to be most crucial in judging a proposal addressed the type of project proposed rather than the quality of the proposal itself. Specific criteria are as follows:

- o Link to users and/or networks is required (e.g., to community-based groups)
- o "Appropriateness" of the technology proposed:
  - . effects on the environment
  - . contribution to greater self-reliance
  - . contribution to regional self-sufficiency
  - . promotion of resource conservation
  - . community involvement in the project
  - . utilization of local residents
  - . consideration for cultural values and practices
  - . provision of enhanced local employment opportunities
  - . simplicity and smallness of scale
  - . promotion of cooperativeness within the community
  - . practicality for the individual, small businessperson or small farmer
- o Staff competencies and experience in appropriate technology
- o Proposed technical approach
  - . creativity of the approach
  - . integrated or holistic nature of the approach
  - . broadness of the approach
  - . number of persons who could benefit from the proposed technique or technology
  - . educational nature of the approach
- o Quality of the information dissemination plan

Evaluation of Recommended Program Guidelines. The above sets of recommendations seek to guarantee the appropriate technology community of the following:

- The NSF appropriate technology program will be directed toward and, in large part, controlled by appropriate technology advocates and practitioners.
- The guidelines for proposing and receiving grant money will encourage participation by appropriate technology practitioners. Some components of the AT program will be restricted to practitioners. In all cases, involvement of community groups will be required.
- There will be an emphasis in the appropriate technology program on research applied to systems practical in the short term. Many research projects will not only design, test and monitor projects, but also demonstrate their feasibility directly to the public.

One program structure that could carry out these recommendations as well as activate the appropriate technology community's interest and involvement in the program is shown in Figure 4. This structure includes interaction between NSF and both the appropriate technology community and other federal government agencies interested in the area. The formation of advisory committees at federal and regional levels will provide balanced input into and evaluation of the program and will establish a framework for a federal information dissemination network. Regional peer review will permit those who are most aware of local climate, socio-economic conditions, expertise and technological needs to evaluate proposals for regional projects.

Recommendations for Program Activities

Figure 3 shown previously on page 52 depicts the hierarchy of needs to be met for the adoption of appropriate technologies to occur. An NSF program in AT could contribute to resolving a number of these needs. Participants in the regional forums believed that NSF could contribute as follows in each of the four major need categories:

Social, Political, and Economic Studies

- Determine quality of life measurements for comparing alternative patterns of technological and social development.
- Develop methodologies for performing economic evaluations of alternatives.

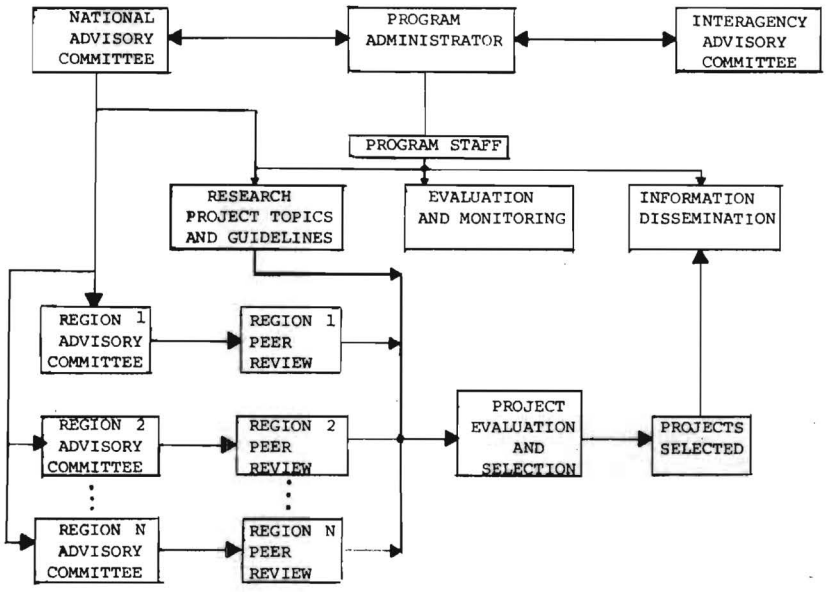


Figure 4: Recommended Program Structure

- Perform assessments of the social, political, and economic impacts of alternatives.
- Identify institutional barriers to the adoption of appropriate technologies.
- Devise and evaluate policy options to foster and guide the implementation of appropriate technologies.
- Identify nongovernment mechanisms that enhance opportunities for the adoption of appropriate technologies.
- Characterize attitudes and values that inhibit or encourage adoption of appropriate technologies.
- Delineate approaches for influencing public opinions and attitudes toward appropriate technologies.

Technical Research

- Monitor, test, and evaluate the performance of appropriate technologies that are currently operable.
- Devise conceptual designs for technologies unproven on community scales.
- Perform feasibility studies of alternative appropriate technology designs.
- Develop designs for approaches that incorporate appropriate technology values and techniques into individual and community lifestyles.
- Develop holistic designs that incorporate appropriate technology into different systems in which people live and work.

Educational Programs

- Determine the educational needs and priorities of appropriate technology.
- Identify the target groups which most need to be reached.
- Delineate the types of educational programs that should be supported by NSF or other federal agencies.
- Characterize how appropriate technology values are implicitly or explicitly expressed in current curricula.
- Sponsor appropriate technology internships and scholarships.
- Develop curricula for appropriate technology programs.
- Assess and perform rural-urban technology transfer.
- Sponsor short courses.

- o Conduct courses for appropriate technology entrepreneurs.
- o Conduct work-learn programs that involve hands-on experience as well as "book-learning."
- o Determine how appropriate technology values can be presented through the mass media.
- o Educate financial and building institutions in the advantages of appropriate technology utilization.

Information Dissemination

- o Make use of mobile AT project displays and demonstrations.
- o Investigate appropriate technology extension service (field consultants).
- o Emphasize clarity of written materials to the lay public.
- o Organize community demonstrations and tours.
- o Sponsor appropriate technology centers.
- o Use existing networks for information.
- o Disseminate results of successful projects.
- o Organize an AT speakers' bureau.
- o Establish AT information dissemination networks and processes.
- o Fund information bank for people to identify information sources, people and plans (schematics).
- o Collect and disseminate existing international AT information.
- o Establish AT journal (national and regional).
- o Sponsor public events and displays of appropriate technology.
- o Establish community level exchanges between scientists and citizens.

A suggested structure for the above activities is shown in Figure 5. The program areas listed - urban innovation, rural revitalization and general appropriate technology studies - were based on the recommendations discussed earlier. They will each address the four need categories. That is, social, political and economic studies; technical research; educational programs and information dissemination will be conducted within

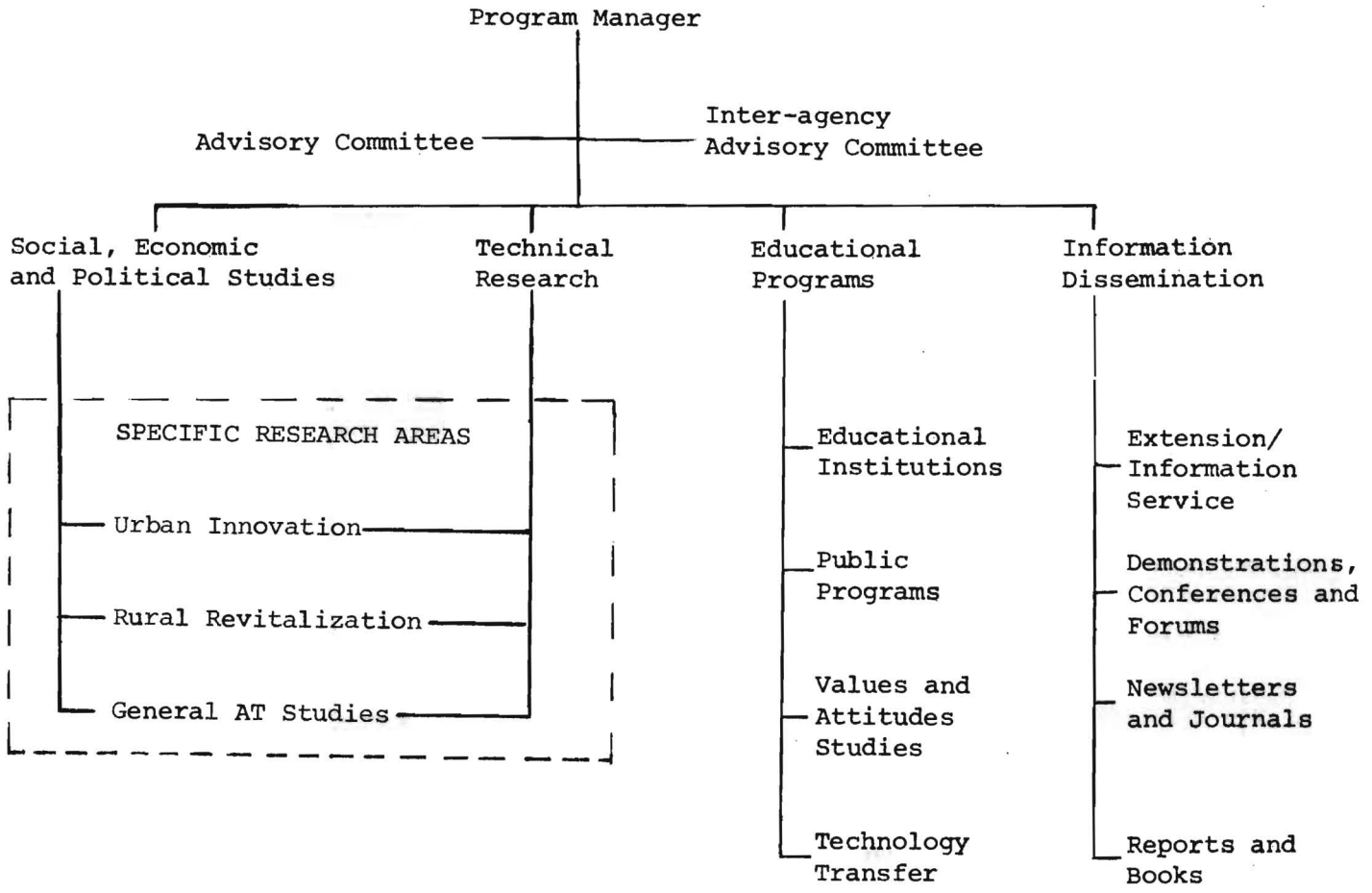


Figure 5: Structure of a NSF Research Program in Appropriate Technology

each program area. The urban and rural program areas will seek through research to devise solutions to sets of problems that are quite diverse, but have common roots. The migration of the rural individual to the city has contributed to the deterioration of many urban areas and to the depletion of the economic base in rural communities. The general AT studies area will take a broader look into alternative strategies for future development.

Urban Innovation. Many attendees at the forums saw an important role for appropriate technology in helping to solve our nation's urban problems. They were concerned about the plight of the poor, the high rate of urban unemployment, the decay of commercial and residential areas in cities and relatively high levels of environmental pollutants in many of our cities. A background paper written by members of the National Center for Appropriate Technology for the Midwest/Mountain Plains forum addressed the applicability of appropriate technology in urban settings. The paper said:

> "Appropriate Technology is currently an insignficant factor in urban development. Among the primary reasons for this is the complexity of the urban community and the extensive interdependence of existing urban economic, social, and political systems and their dependence on massive energy consumption and high technology methods to meet energy and energy-related needs.
>
> Also, Appropriate Technology has not yet attracted the attention and interest of mainstream urban planners and persons engaged in social and economic development programs. Priorities are viewed as jobs, income, health, welfare, education, economic development, and housing supply and condition. Appropriate Technology has not been accepted as a way to respond to these concerns. Weatherization programs constitute the largest single use of Appropriate Technology in most urban areas to date."

The thrust of research in the urban innovation area should be both integrated and multi-disciplinary. Participants stressed the importance of both technological and socio-economic research into appropriate technology. Solutions to urban problems require a mixture of hardware and software. The executive assistant to the mayor of Houston, discussing the role of AT in cities at the Southwest forum, said,

> "At the present time, neighborhoods which have made efforts to rehabilitate their housing and improve the quality of their areas are taxed summarily--some of these areas have been taxed up about 300%. It's not the appropriate way to provide incentive for improvement. We have a long way to go; it is going to be up to AT practitioners to provide solutions in a systems approach so that cities can respond appropriately."

Thus, the people are cognizant of the technology and are trying to implement it. However, tax policies have become constraints. Research into institutional barriers is needed in this case.

The attendees felt an important concern that technologies designed for urban application should be safe and utilize natural systems as much as possible. Technologies identified as having important potential included both passive and active solar energy, photovoltaics, resource recovery plants, source separation of recyclables, waterless toilets or closed cycle filtration systems, urban agriculture with minimal use of chemical fertilizers and pesticides, food cooperatives, housing rehabilitation cooperatives, mass transit, and bikeways.

Participants felt that because many of our current technologies try to protect and isolate us from natural systems, we lack knowledge of how to best integrate our current needs with natural systems. Research could divulge important relationships that can be used to our advantage in an environmentally benign manner. For example, we could learn new approaches for humidity control in structures, and could devise safe and convenient ways to decrease the loading on municipal sewage treatment plants.

Perhaps one of the highest research priorities discussed at the forum is to meet the needs of the poor. Research into technical design should include consultation with members of low income groups to ensure that the designs are compatible with those who will use them. As the participants in the Northeast Forum's community involvement and social impact workshop said, "...the thing we are trying to avoid is always having the experts get together and talk to themselves." Most of the forums strongly advocated involvement of the local community and community groups in research projects.

In the urban innovation program area, typical research questions are as follows:

- Are urban applications of appropriate technologies economically viable?
- What are the environmental, economic and social impacts of urban appropriate technology?
- What institutional constraints to appropriate technology implementation exist in low-income, high-density communities and neighborhoods?
- What will be the socio-cultural impact of widespread implementation of appropriate technology in an urban setting (e.g., on attractiveness of inner-city living, on crime rate, etc.)?
- How consistent are appropriate technology values and the economic growth orientation of urban areas in many regions?
- How do existing standards and codes in urban areas impede appropriate technology implementation?
- Can urban agricultural systems be designed to yield significant production for local markets?
- What urban approaches can be developed to incorporate appropriate technologies into urban communities in an integrated manner?
- What would be the impact of widespread appropriate technology implementation on the community tax base?
- What are the technological needs for downtown, skill-oriented small industries (e.g., apparel)?
- How can holistic city planning be encouraged?
- What impact would appropriate technology implementation have on urban unemployment, particularly the "hard-core" unemployed?

Rural revitalization. Many attendees at the forums expressed extreme concern over the fate of rural communities and of agriculture. They blamed large scale agribusiness for running small farming enterprises out of business. They believed that the adoption of appropriate technologies could improve the outlook for small farmers and other rural residents alike. In discussing the role of AT in rural areas, a background paper for the Midwest/Mountain Plains forum said:

> "Most attention in rural areas to Appropriate Technology has focused on the problems of retaining or conserving small family farms, including the attendant issues of competition for land resources and the marketplace between small family

farms and large-scale agribusiness. The marginal profit status for most family farms is particularly affected by dependence on regional power sources for electricity and natural gas and a high dependence on petroleum and petroleum-based products.

Rural communities also need to receive particular attention because many of these communities are faced with problems far beyond local capacity to solve: inadequate waste water treatment systems; water quality and supply problems (both for drinking water and irrigation); dependence on regional utility systems with rapidly increasing rates; limited transportation options; and an inadequate housing supply.

Appropriate Technology research should address issues relevant to both family farms and rural villages and cities. The level of dependency by these communities on external economic and political forces is one of the key reasons for the continued decline in rural development."

Many solutions to problems in other areas are not applicable in rural settings. Resource recovery plants and source separation schemes are not economically feasible in regions with low population densities. Utilization of community energy systems are also infeasible because of the costs of transporting energy over long distances. However, because of their remoteness, rural communities may find photovoltaic cells more competitive with electricity, and active and passive solar energy more competitive with propane and natural gas than urban communities.

Of course, a major concern of the forum participants was agriculture. Many of the attendees believed that with research, adequate means of organic fertilization and pest control could be developed. They saw a major role for NSF in designing and testing these techniques. Research could also help devise agricultural methods that are both efficient and cost effective in small scale applications.

Another major research area is to design and assess alternative rural revitalization strategies. The strategies should focus on the provision of basic needs for rural areas in different regions. For example, in the Southwest forum, participants expressed the need for research into both water conservation techniques and ways of increasing water availability without disturbing the fragile desert ecosystem.

General research topics in the rural revitalization research area are as follows:

- What factors have led to the massive migration to urban areas? Is a reversal or stabilization possible?
- What factors might increase the viability of the small farmer?
- What would be the national energy impact of a national "co-op" economy? Of a strong biological thrust in agriculture?
- What biological interrelationships between plants and insects can be used in biological pest control?
- How does biologically grown produce compare economically with that grown using conventional methods?
- What are the dynamics of soil quality over time on biological farms?
- What are feasible designs for integrated, nearly self-sufficient farms?
- What are the effects of the potential widespread adoption of appropriate agricultural technology in rural areas?
- Can AT aid small family farmers in becoming more self-sufficient?
- What can be learned from other countries about the relationship among institutions, appropriate technology, and economic incentives that may be useful to the U.S.?
- What kinds of technical assistance and communication mechanisms are needed by small farmers to enable them to have the best opportunity to survive in the market?
- Can equipment be designed that represents a low investment for the small farmer?
- What small scale industries are viable that use local material and human resources in rural areas?

General appropriate technology studies. Many of the participants at the regional forums stressed the importance of examining current approaches for technological and societal development. They believed that our society emphasizes consumption too much and quality too little. Attendees at the Northeast forum felt that a "let-the-experts-do-it" mentality on the part of the public and the public's feeling of powerlessness in identifying and meeting their needs were major barriers to the adoption of AT. The West Coast forum identified people's unwillingness to change as the major barrier to appropriate technology. Thus, one component in the general studies area would be characterizing

American values and attitudes, and evaluating how these fit appropriate technology values.

The general studies activity would also develop methodologies for evaluating appropriate technologies. This function, discussed earlier, would find common grounds for comparing conventional and alternative approaches for technical problem-solving.

The major implications of the adoption of AT on a widespread scale could also be examined in the activity. Altering our technological research and development strategies would have important impacts on the environment, on the balance of trade, on material and energy resource needs, and on international relations.

Research topics in the general AT studies activity are as follows:

- What are the technological requirements for soft-technology development?
- Is appropriate technology a step backward?
- How would an appropriate technology future look? Which of peoples' basic needs would most likely be unsatisfied? How much restructuring on physical, mental and value planes is needed?
- What are the comparative capital requirements of the soft and hard path?
- What are the major institutional constraints to appropriate technology development? How, if at all, can they best be overcome?
- What would the international implications of our adoption of an appropriate technology path be?

APPENDIX I

APPROPRIATE TECHNOLOGY FORUMS

MAJOR CONCLUSIONS AND RECOMMENDATIONS

APPROPRIATE TECHNOLOGY FORUMS: MAJOR CONCLUSIONS AND RECOMMENDATIONS

I. PROGRAM STRUCTURE

A. Program Planning and Administration

1. Establish appropriate technology advisory committee
2. Regional grant administration
3. Joint ventures with other agencies: Federal, state, local
4. Public review of appropriate technology program
5. Support appropriate technology road show
6. Fund appropriate technology extension service
7. Fund information dissemination for existing appropriate technology activities and organizations
8. Use DOE Small Scale Technology program as a model
9. Fund awards with low budgets - possible funding limit

B. Proposal Solicitation

1. Multiple submission procedures for various sectors
2. Encourage multi-sector participation
3. Active solicitation
4. Aim solicitation at appropriate technology community

C. Proposal Review and Award

1. Regional or state peer review
2. Review conducted only by appropriate technology community

D. Criteria For Appropriate Technology Projects

1. Link to users and/or networks is required (e.g. to community-based groups)
2. "Appropriateness" of the technology proposed:
   a. effects on the environment
   b. contribution to greater self-reliance
   c. promotion of resource conservation
   d. community involvement in the project
   e. utilization of local resources
   f. consideration for cultural values and practices
   g. provision of enhanced local employment opportunities
   h. simplicity and smallness of scale
   i. promotion of cooperativeness within the community
   j. practicality for the individual, small businessperson or small farmer

3. Staff competencies and experience in appropriate technology.
4. Proposed technical approach:
    a. creativity of the approach
    b. integrated or holistic nature of the approach
    c. broadness of the approach
    d. number of persons who could benefit from the proposed technique or technology
    e. educational nature of the approach
5. Quality of the information dissemination plan.

E. Evaluation and Monitoring

1. NSF should be willing to accept failure of appropriate technology projects.
2. Simplified reporting procedures.

II. RESEARCH AREAS

A. Alternatives to Conventional Transportation

1. Bikeways
2. Alternative transportation modes
3. Alternatives to transportation (e.g. communication)

B. Rural Revitalization

1. Holistic designs
2. Marketing techniques for farmer and consumer co-ops
3. Small farm appropriate technology applications
4. Small scale gasifiers/digesters
5. Integrated pest management
6. Biological control of pests
7. Comparison of nutritional content and economics of biological farming
8. Economics of local production (impacts)
9. Impact of labor intensiveness
10. Rural revitalization
11. Family farm viability
12. Viability of small agriculture-related businesses
13. Local food production
14. Economic comparison of large and small production systems
15. Labor impact of appropriate technology implementation

16. Appropriate technology demonstration projects
17. Applications of alternative energy sources: solar, wind, biomass, wood, hydropower
18. Research into materials present locally (raw or recycled)
19. Holistic health
20. Studies of "bioregions" and how human systems can best fit into natural systems

C. Community Revitalization

1. Holistic designs
2. Small scale gasifiers/digesters
3. Impact of labor intensiveness
4. Local food production
5. Economic comparison of large and small production systems
6. Labor impact of appropriate technology implementation
7. Course for appropriate technology entrepreneur
8. Appropriate technology demonstration projects
9. Applications of alternative energy sources: solar, wind, biomass, wood, hydropower
10. Research into materials present locally (raw or recycled)
11. Holistic health
12. Housing regulations and codes pertinent to innovative alternatives in housing
13. Studies of "bioregions" and how human systems can best fit into natural systems
14. Research in identification of and overcoming restraints to a self-reliant community
15. Cooperative community projects (e.g. greenhouse construction)
16. Study the viability of different scales of marketing and distribution of goods

D. Dissemination

1. What appropriate technology values are implicity or explicity expressed in the print or electronic media?
2. What is the best model for an appropriate technology extension service considering location, structure and scale of activities?
3. Can appropriate technology be incorporated into existing extension services?
4. Work-learn programs that involve hands-on experience, as well as "book-learning".
5. Forums conducted by community organizations on appropriate technology applications.

6. Public events and displays of appropriate technology that reflect appropriate technology values.

7. An appropriate technology extension service.

8. Appropriate technology demonstration projects.

9. How can appropriate technology values be presented through the mass media?

E. Education

1. What attitudinal factors need to be considered in motivating people to accept appropriate technology solutions to problems?

2. What appropriate technology values are implicitly or explicity expressed in current curricula?

3. Appropriate technology internships and scholarships

4. Curriculum development

5. Rural-urban technology transfer exchange

6. Short courses

7. Course for appropriate technology entrepreneur

8. Work-learn programs that involve hands-on experience, as well as "book-learning"

9. How can appropriate technology values be presented through the mass media?

F. Resource Recovery

1. Research into materials present locally (raw or recycled)

2. Waste recycling and reduction:

   a. study the impact of changes in government policy (e.g. freight rates) on markets for secondary materials

   b. perform basic research into recycling as yet unrecyclable, non-biodegradable products (e.g. NSF Materials Research Division's Research into plastics recycling).

   c. study alternative markets for human waste (e.g. fuel or fertilizer).

   d. assess the environmental, health, economic and institutional impacts of widespread implementation of waterless toilets

3. Study of constraints to recycling:

   a. market development

   b. freight rates - virgin vs. recycled materials

   c. depletion allowance on natural resource exploitation

   d. institutional - resistance to adopt non-centralized techniques

   e. cultural - waste-oriented society

4. Small scale resource recovery

5. Regulations and codes
6. Durability/usefulness, non-obsolescence of products
7. Source reduction

G. Water

1. Small scale water supply systems, especially in urban areas
2. Alternative water treatment systems

H. Appropriate Technology Studies

1. Failure of financial institutions to give support to appropriate technology
2. Redefinition of economics
3. Economic comparison of large and small production systems
4. Evaluate subsidization of all alternatives and compare with appropriate technology, e.g. energy, agriculture
5. What attitudinal factors need to be considered in motivating people to accept appropriate technology solutions to problems?
6. What appropriate technology values are implicity or explicitly expressed in the print and electronic media?
7. Applications of alternative energy sources: solar, wind, biomass, wood, hydropower
8. Should study "net energy budget" of producing alternate fuels
9. Barriers to appropriate technology
10. Comparison of conventional and appropriate technology delivery systems
11. Regulations and codes
12. Evaluate the comparative economic and social impacts of conventional and appropriate technology approaches to economic development
13. Examine socio-cultural impacts of appropriate technology
14. What current values restrict implementation of appropriate technology and how can they be changed?
15. Impact of government regulation on maintenance of status quo
16. Methodology for comparing impacts of appropriate technology with conventional projects
17. Scenario of how an appropriate-technology soicety could develop from current U.S.
18. Technological assessment of appropriate technology

III. INFORMATION DISSEMINATION AND NETWORKING

1. Mobile displays
2. AT extension service (field consultants)
3. AT labs
4. AT school programs
5. Information dissemination method and content should be understandable to common man
6. Community demonstrations
7. AT centers
8. Use existing networks for information dissemination instead of creating new ones
9. Results of successful projects should be disseminated
10. AT speakers bureau
11. Establish AT information dissemination networks, processes.
12. Fund information bank for people to identify information sources, people and plans (schematics)
13. Existing international AT information
14. Establish AT journal (national)

IV. ROLES OF GOVERNMENT AGENCIES

1. NSF demonstration programs
2. NSF - more applied research
3. NSF - orient existing programs to appropriate technology
4. NSF - appropriate technology considered in every program - "appropriateness" of all NSF programs
5. Formal appropriate technology curriculum development
6. Information dissemination methods and contents in general should be understandable to the common man
7. Tax credits for appropriate technology development

V. RECOMMENDATIONS AND CONCLUSIONS FOR APPROPRIATE TECHNOLOGY ADVOCACY

1. NSF should recognize the sense of independence possessed by many appropriate technologists. This independence tends to make them dislike government programs. However, they feel if other groups are being funded to do "inappropriate research", they should receive funds to do appropriate research. The dilemna is that appropriate technology eschews and condemns power, thus giving up the very weapons needed to develop it.

2. Appropriate technology enthusiasts should become much more active politically. Suggestions, such as support for appropriate technology political candidates, and active coalition-building, were well received at the forums. Better publicity for what is being done in appropriate technology is needed.

3. Educate politicians about appropriate technology - show a constituency

4. Funding small projects for a brief period of time may be more destructive than good. Fears that promises of potential funding create stagnation of individual innovation and risk taking and foster dependency on a grants economy were voiced by forum attendees.

5. One individual felt that appropriate technology economy was basically a producer's economy and, thus opposed our current knowledge economy. He said that appropriate technology lacked the dynamic of spin-offs generated by high-technology capital intensiveness.

6. There was general disagreement with overall NSF policy. Several individuals advocated a revamping of NSF. A proposal to alter the NSF peer review to include key people, public interest groups and minority groups was popular with many attendees. More generally, several individuals proposed that appropriate technology philosophy be extended to everything the government does.

7. Appropriate technology offices are needed at the local government level.

8. Stress the economic, social and environmental benefits of appropriate technology.

9. Derive support from other advocacy groups: labor unions, solar groups, etc.

10. Get to know personally members of the media in your locality.

11. Networking is essential.

12. Press for a high appropriate technology budget in an NSF program (i.e. $10 million)

13. Work through Congressional Science and Technology Committees e.g. Rep. Harkin of Iowa and Sen. Kennedy of Massachusetts.

APPENDIX II

ADVISORY COMMITTEES FOR THE REGIONAL FORUMS

ON APPROPRIATE TECHNOLOGY

ADVISORY COMMITTEE

NORTHWEST FORUM ON APPROPRIATE TECHNOLOGY

CALIFORNIA

Isao Fujimoto
Writer
Past Director - National Center for Appropriate Technology
Sacramento, CA

Bill Owen
City Attorney
Davis, CA

Richard Wenn
Communications Specialist for Santa Clara County
Office of Appropriate Technology
San Jose, CA

Kirk Marckwald
Assistant Director
California Office of Appropriate Technology

Cliff Humphrey
Ecology Action
Modesto, CA

Mack Walker
Wastewater Management Specialist
California Office of Appropriate Technology
Sacramento, CA

Mary Louise Flint
California Department of Food and Agriculture
Environmental Assessment Team
Sacramento, CA

COLORADO

Marcia Grad
Center for Research and Development
Denver Research Institute
Denver, CO

MONTANA

Kye Cochran
Director
Alternative Energy Resources Organization
Billings, MT

MONTANA (Cont'd)

Frank Manley
Regional Economic Development Specialist
National Center for Appropriate Technology
Butte, MT

OREGON

Tom Bender
Writer
Rain Magazine
Portland, OR

Lee Johnson
Writer
Rain Magazine
Portland, OR

Lynn Miller
Farmer, editor-publisher
Small Farmers Journal
Junction City, OR

Bill Mackie
Energy/Land Use Specialist
McMinnville, OR

Gerald Udell
Director
Innovation Center
University of Oregon
Eugene, OR

Connie Holvey
Eugene Growth Management Task Force
Eugene, OR

Tom Brandt
Lane County Office of Appropriate Technology
Eugene, OR

Sam Sadler
Director
Lane County Office of Appropriate Technology
Eugene, OR

Don Williams
Wastewater Management Specialist
Eugene, OR

Don Corsen
Wastewater Management Specialist
Eugene, OR

OREGON (Cont'd)

Brian Livingston
Editor
Cascade Journal of the Northwest
Eugene, OR

Doug Boleyn
Manager, Solar Resources
Portland General Electric
Portland, OR

Lowell Rhoden
Entrepreneur
Eugene, OR

WASHINGTON

Steve Bossi
Director
Rural America Incorporated
Seattle, WA

OUTSIDE OF THE REGION

Roger Blobaum
Director
Small Farm Energy Project
Cresta, IA

David Morris
Co-Director
Institute for Local Self-Reliance
Washington, DC

ADVISORY COMMITTEE

SOUTHEASTERN FORUM ON APPROPRIATE TECHNOLOGY

ALABAMA

Ed Passerini
New College, University of Alabama
Tuscaloosa, AL

Albert Turner
Southwest Alabama Farmers' Cooperative
Selma, AL

DISTRICT OF COLUMBIA

Harriet Barlow
Institute for Local Self Reliance
Washington, DC

Ken Bossong
Citizens' Energy Project
Washington, DC

Larry Shirley
Center for Renewable Resources
Washington, DC

GEORGIA

Dennis Creech
Atlanta 2000
Atlanta, GA

Carolyn Graham
Atlanta 2000
Atlanta, GA

Steve Levetan
Dixie Iron & Metal Company
Atlanta, GA

George Ramsey
Passive Energy Lab
Georgia Tech
Atlanta, GA

Randy Schwartz
Claude Terry & Associates
Atlanta, GA

Betty Terry
Georgia Solar Coalition
Atlanta, GA

GEORGIA (Cont'd)

Lynn Westergard
Atlanta Chamber of Commerce Energy Committee
Atlanta, GA

KENTUCKY

John Clemmens
Appalachia Science in the Public Interest
Corbin, KY

Al Fritsch
Appalachia Science in the Public Interest
Corbin, KY

MISSISSIPPI

Ron Lewis
Sierra Club
Jackson, MS

SOUTH CAROLINA

Norman Repanich
Director of Economic Development
Greenville, SC

TENNESSEE

Lindsay Jones
Agricultural Marketing Project
Nashville, TN

VIRGINIA

Brian Crutchfield
National Center for Appropriate Technology
Radford, VA

Kathy Crutchfield
National Center for Appropriate Technology
Radford, VA

WEST VIRGINIA

Paul deVore
West Virginia University
Morgantown, WV

ADVISORY COMMITTEE

WEST COAST FORUM ON APPROPRIATE TECHNOLOGY

ARIZONA

Roger Caldwell
University of Arizona

Gerry Cunningham
Office of the Governor
Phoenix, AZ

Nigel Dickens
Chino Valley Adobe Works
Chino Valley, AZ

Kenneth E. Foster
University of Arizona

Dan Halacy
Arizona Solar Energy Association
Glendale, AZ

Sue Lofgren
League of Women Voters
Tempe, AZ

Art Montez
Private Citizen
Tucson, AZ

Clinton Pattea
Arizona Commission on Indian Affairs
Phoenix, AZ

Lina Robinson
Energy Consultant
Phoenix, AZ

Terry Triffet
University of Arizona

CALIFORNIA

Robert Judd
Office of Appropriate Technology
Sacramento, CA

Bart Lucarelli
Lawrence-Berkeley Laboratory
Sacramento, CA

CALIFORNIA (Cont'd)

Tom Chester
Department of Energy
Oakland, CA

MONTANA

Jerry Plunkett
Montana Energy Research & Development Institute
Butte, MT

Lee Topash
National Center for Appropriate Technology
Helena, MT

NEVADA

Robert Loux
Department of Energy
Carson City, NV

UTAH

Kerry Faigle
Utah Department of Energy
Salt Lake City, UT

WISCONSIN

Anthony Maggiore
National Center for Appropriate Technology
Milwaukee, WI

ADVISORY COMMITTEE

MIDWEST/MOUNTAIN PLAINS FORUM ON APPROPRIATE TECHNOLOGY

COLORADO

Dennis Holloway
Architect
Environmental Design College
University of Colorado

Ray Wells
National Western Capital Co.

Maria Valdez
People's Alternative Energy Service

IOWA

Skip Laitner
Iowa Community Action Research Group
Ames, IA

Hon. William Griffee
House of Representatives
State Capitol
Des Moines, IA

KANSAS

Sam York
Community Action Program
Elwood, KS

Buford Watson
City Manager
Lawrence, KS

MISSOURI

Arlen Diamond
KSMU Radio Station
Southwest Missouri State University
Springfield, MO

Robert Kipp
City Manager
Kansas City, MO

NEBRASKA

Gary Wright
Board of Directors
National Center for Appropriate Technology
Tekamah, NB

Ron Krupicka
Co-Director
Small Farm Energy Project
Hartington, NB

NORTH DAKOTA

Carl Whitman
Executive Director
Industrial Development Division
Three Affiliated Tribes
ND

David Hilde
Northern Solar Power Company
Fargo, ND

SOUTH DAKOTA

Anne Kunze
Consultant
South Dakota Representative for
Friends of the Earth
Alpena, SD

Ed Driving Hawk
Chairman
Rosebud Sioux Indian Tribe
SD

WYOMING

Gary Garber
Energy Coordinator
Community Action of Laramie County
Hillsdale, WY

Charles Nations
Solar Workshop Instructor
Lander, WY

ADVISORY COMMITTEE

SOUTHWEST FORUM ON APPROPRIATE TECHNOLOGY

ARKANSAS

Mr. Edd Jeffords
Arkansas State Coordinator
Executive Director
The Ozark Institute
Eureka Springs, AR

Mr. Jerry Webster
Executive Director
Housing Development Corporation
Little Rock, AR

Dr. Barton Westerlund
Director
Industrial Research & Extension Center
University of Arkansas
Little Rock, AR

LOUISIANA

Dr. Kenneth J. Lacho
Louisiana State Coordinator
Associate Director, Division of Business & Economic Research
University of New Orleans
New Orleans, LA

Dr. Gordon A. Saussy
Director
Division of Business & Economic Research
University of New Orleans
New Orleans, LA

NEW MEXICO

Dr. William A. Gross
New Mexico State Coordinator
Dean of Engineering
University of New Mexico
Albuquerque, NM

Mr. Bristol L. Stickney
New Mexico Solar Energy Association
Santa Fe, NM

NEW MEXICO (Cont'd)...

Mr. Dwight L. Walker
Bureau of Community Affairs
New Mexico Department of Human Resources
Santa Fe, NM

OKLAHOMA

Dr. H. Jack Allison
Oklahoma State Coordinator
Professor, Department of Electrical Engineering
Oklahoma State University
Stillwater, OK

TEXAS

Mr. John Castillo
Executive Assistant to the Mayor
Houston, TX

Dr. A. David Nawrocki
Institute of Design of Environmental Alternatives
San Antonio, TX

Ms. Elizabeth Sifuentes
South Texas Rural Coalition
Pearsall, TX

Mr. Charles L. Simien
Texas State Coordinator
Weatherization Specialist
Texas Housing Development Corporation
Austin, TX

Mr. Dee Simpson
Regional Director
National Center of Appropriate Technology
Fort Worth, TX

ADVISORY COMMITTEE

MIDWEST FORUM ON APPROPRIATE TECHNOLOGY

ILLINOIS

Bethe Hagens
Editor of Acorn Magazine
Professor of Anthropology at Governors State University
Park Forest South, IL

INDIANA

William Beranek
Director
Holcomb Research Institute
Indianapolis, IN

William Caddell
Director of the Frankfort Public Library
Frankfort, IN

MICHIGAN

Mary Appelhoff
Organic Growers of Michigan
Kalamazoo, MI

MINNESOTA

Don Marier
Editor
Alternative Sources of Energy Magazine
Milaca, MN

WISCONSIN

John Steinhart
Professor of Geophysics & Environmental Studies
University of Wisconsin
Madison, WI

ADVISORY COMMITTEE

NORTHEAST REGIONAL APPROPRIATE TECHNOLOGY FORUM

CONNECTICUT

Robert Shortreed
National Center for Appropriate Technology
Stafford Springs, CT

DELAWARE

Marilyn Morris
Delawareans for Energy Conservation
Georgetown, DE

MAINE

Chaitanya York
Director
Maine Organic Farmers & Gardners Assn.
Hallowell, ME

MASSACHUSETTS

Mitchell Anthony
Co-Editor, New Roots
Amherst, MA

Hugh Davis
Director
Institute for Man & Environment
Amherst, MA

Francis Koster
Associate Director
UMass Energy Office
Amherst, MA

Christina Rawley
Education Coordinator
New Alchemy Institute
Woods Hole, MA

Pat Lewis Sackrey
Co-Director
Center for Rural Communities
Amherst, MA

Donald Stone
School of Business Administration
University of Massachusetts
Amherst, MA

MASSACHUSETTS (Cont'd)

Richard Taupier
Director
Toward Tomorrow Fair
Amherst, MA

Peter Wagschal
Director
Future Studies Program
UMass
Amherst, MA

NEW HAMPSHIRE

Drew Gillette
Director
New England Solar Energy Assn.
Bedford, NH

NEW JERSEY

Edward Lloyd
Director
New Jersey PIRG
Trenton, NJ

NEW YORK

Thomas Oliphant
Legislative Energy Staff
Albany, NY

PENNSYLVANIA

Jerry Kellman
Director
The Pennsylvania Alliance
Philadelphia, PA

RHODE ISLAND

Adelaide Luber
Director
Cranston CAP
Cranston, RI